A GEO-BEHAVIOURAL MODEL OF STRANGER RAPE: IMPLICATIONS FOR OFFENDER PROFILING AND LINKING

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy by Freya Newman

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June 2011

ACKNOWLEDGEMENTS

I would like to thank Professor Laurence Alison for his extremely helpful supervision patience and above all, for rescuing me.

I am greatly appreciative to the Economic and Social Research Council (ESRC) and the Metropolitan Police Service for jointly funding this Collaborative Studentship and to the latter for providing me with access to data. In particular, I would like to thank Police Constable Ian Oldfield and Police Sergeant Peter Bleakley for their unlimited help and support with data collection and question answering.

I would also like to thank dear friends for their encouragement and wisdom, particularly Dr Louise Almond, Louise Goodwin, Marie Eyre, Dr Keri Nixon, Dr Mary Santarcangelo and Dr Susan Giles.

To my parents and Rowan, thank you for your relentless support and great patience; I owe you everything. Especially thank you to Tom; I really could not have finished this without your love and true grit. And lastly, this is for Alicia.

ABSTRACT

Intelligence-led policing and the introduction of the National Intelligence Model have emphasised the need to gather information around the crimes and characteristics of prolific offenders. The police and crime analysts have been tasked to find more reliable, efficient ways to carry out methods such as suspect prioritisation ('offender profiling') and case linkage. Three tenets underpinning such tasks are homology (Alison, Bennell, Mokros, & Ormerod, 2002), offender consistency (for example, Canter, 1995) and inter-offender variation (for example, Goodwill & Alison, 2007). Research considering homology has drawn varied conclusions, with some studies providing support for this (for example, Canter & Fritzon, 1998), and others finding that, offenders who behave in similar ways within their crimes, do not readily share similar characteristics (for example, Mokros & Alison, 2002). Research investigating the consistency hypothesis, however, has been more promising, with support for the consistent exhibition of particular behaviours over crime series (for example, Bennell & Canter, 2002). There has been a consensus that elements of the offenders' spatial behaviour, notably inter-crime proximity, is consistent across crimes and provides particular accuracy at predicting whether two crimes are linked (for example, Markson, Woodhams, & Bond, 2010). Ideas drawn from environmental criminology theories, such as Routine Activity Theory (Cohen & Felson, 1979) help to explain why offenders usually commit offences in locations that are close together. Moreover, ideas from personality theory highlight the particular consistency of behaviours that are within the offenders' control (Funder & Colvin, 1991) which may explain why spatial behaviours are especially useful (Bennell & Jones, 2005). In addition, researchers have called for a more detailed examination of the impact context (such as the location of the offence) has on the exhibition of behaviours within crimes (Mokros & Alison, 2002). A recently developed model highlights the dynamic nature of the rape event, and how geographic and offence behaviours may interact (Beauregard, Proulx, Rossmo, & Leclerc, 2007). However, this model is limited in its application to the investigation of rapes perpetrated by an unknown offender, it uses analysis techniques that may not fully explore the qualitative inter-relationships between geographical and behavioural variables and it is based on a model (Rossmo, 1997) that has not been empirically tested (van der Kemp & van Koppen, 2001). Thus, the aim of this thesis was to develop a model of the spatial mobility of stranger rapists *within* their offences and examine how this behaviour is related to offence behaviour. Moreover, the ability of the model to predict offender background characteristics ('offender profiling') and link crimes together is considered.

The records of 112 detected stranger rape cases occurring between 2004 and 2006, reported to the Metropolitan Police Service were used as the main data set for this thesis. Thematic analysis resulted in four Geo-mobility styles being established; Intruded, Ambushed, Abducted and Followed. These were found to be related to three behavioural themes; Intruded rapes were related to those which reflected a broad Criminal style, Ambushed and Followed rapes were associated to those which reflected a broad Violent style, whilst Abducted rapes were associated to those which reflected a broad Sexual style. The Geo-mobility styles were not useful in predicting offender background characteristics, but neither were other spatial or offence behaviours. The Geo-mobility styles were also not exhibited consistently over a linked series (a sub-sample of the original data set). However, inter-initial approach and inter-attack proximity were found to be both consistent and accurate at predicting case linkage. Findings are discussed in terms of theories of rape behaviour, theories of spatial behaviour and ideas about homology, consistency and inter-offender variation. The implications for offender profiling and case linkage are considered, as well as the limitations of the present study and future research ideas.

TABLE OF CONTENTS

Acknowledgements i
Abstract ii
Table of contents iii
List of tables xxii
List of figures xxiv

Chapter 1: Introduction 1
1.1 Background to the thesis 1
1.2 The problem 1
1.3 Prolific offenders and Intelligence-led policing 3
1.4 Offender profiling 4
1.4.1 Approaches to offender profiling 5
1.4.1.1 Motivational classification systems 5
1.4.1.2 Behaviourally based classification systems 7
1.4.1.2.1 Differentiating offence behaviour into themes 7
1.4.1.2.2 Examining individual offence behaviours 9
1.4.2 Evaluation of approaches 10
1.5 Case linkage 11
1.6 The fundamental principles of offender profiling and case linkage 12
1.6.1 Consistency and differentiation 12
1.6.2 Homology 15
1.7 Research considering behavioural consistency 15
1.8 Research considering inter-offender variation and assessing predictive accuracy 18
1.9 Research considering homology 23
1.10 Factors that may affect consistency, differentiation and homology 31
1.11 Summary of offender profiling and case linkage research 34
1.12 The spatial behaviour of offenders 35
1.12.1 Theoretical background 35
1.12.2 Journey to crime research 37
1.12.3 Examinations of spatial behaviour within crimes 38
1.13 Rationale and research questions 39

Chapter 2: Methodology 41
2.1 Sample 41
2.1.1 Source 41
2.1.2 Limitations of using CRIS as a data source 42
2.1.2.1 Consistency 42
2.1.2.2 Validity 43
2.1.2.3 Generalisability 43
2.1.2.4 Biases of victim recall 43
2.1.2.5 Practicality 44
2.1.2.6 Triangulation 44
2.2 Data collection 45
2.2.1 Access to data 45
2.2.2 Training with MPS in their Crime Management Procedure 45
2.2.3 Data selection process 45
2.2.4 Data extraction and cleaning 49
2.2.5 Offence history 52
2.2.6 Serial stranger rape sub-sample 52
2.3 Variables and measures 53
2.3.1 General offence variables 53
2.3.2 Victim background variables 53
2.3.3 Offender background variables 53
2.3.4 Spatial variables 54
2.3.5 Offence behaviour variables 55
2.4 Design and analytical techniques used 56
2.4.1 Chapter Three 56
2.4.2 Chapter Four 56
2.4.3 Chapter Five 57
2.4.4 Chapter Six 58
2.4.5 Chapter Seven 59
2.4.6 Chapter Eight 62

Chapter 3: The Nature of Stranger Rape in London 65
3.1 Introduction 65

	3.1.1	Previous descriptive studies	65
	3.1.2	Studies using police and Criminal Justice System data	65
	3.1.3	Studies using medical data	68
	3.1.4	Studies using victim surveys	70
	3.1.5	Rationale and research questions	72
3.2	Method		72
	3.2.1	Sample	72
	3.2.2	Procedure	73
	3.2.3	Analysis	76
3.3	Results		76
	3.3.1	Timing of offences	76
	3.3.2	Victim characteristics	77
	3.3.2.1	Age	77
	3.3.2.2	Ethnicity	78
	3.3.3	Offender characteristics	78
	3.3.3.1	Age	78
	3.3.3.2	Ethnicity	79
	3.3.3.3	Distance travelled from home base	79
	3.3.4	Offender and victim characteristics	80
	3.3.4.1	Age	80
	3.3.4.2	Ethnicity	80
	3.3.5	Offenders' previous offence history	81
	3.3.5.1	Number of offences	81
	3.3.5.2	Timing of offences	82
	3.3.5.3	Types of offences	82
	3.3.5.4	Offender age at first offence	85
	3.3.5.5	Previous spatial behaviour	86
3.4	Chapter summary		87
Chapter 4: Geo-mobility styles			91
4.1	Introduction		92
	4.1.1	Distribution of offences	92
	4.1.2	Number of locations and mobility within offences	92

	4.1.3	Transportation used	93
	4.1.4	Type of locations	93
	4.1.5	Models of offender's spatial behaviour	97
	4.1.5.1	Commuter versus marauder	97
	4.1.5.2	Rossmo's model	98
	4.1.5.3	Beauregard, Proulx, Rossmo, Leclerc, and Allaire (2007)	100
	4.1.6	Rationale and research questions	104
4.2	Method		105
	4.2.1	Sample	105
	4.2.2	Procedure	106
	4.2.2.1	Descriptive account	106
	4.2.2.2	Spatial mobility within offences	108
	4.2.3	Analysis	108
	4.2.3.1	Content and descriptive analysis	108
	4.2.3.2	Thematic analysis	109
4.3	Results		113
	4.3.1	Descriptive analysis	113
	4.3.1.1	Distribution of offences	113
	4.3.1.2	Number of locations	114
	4.3.1.3	Initial approach location	114
	4.3.1.4	Attack location	115
	4.3.1.5	Crime location	117
	4.3.1.6	Victim release location	118
	4.3.1.7	Transportation	120
	4.3.1.8	Distance travelled within offence	120
	4.3.1.9	Location set	120
	4.3.1.10	Types of location (public or private)	121
	4.3.1.11	Movement	123
	4.3.2	Thematic analysis	124
	4.3.2.1	Intruded	125
	4.3.2.2	Ambushed	130
	4.3.2.3	Abducted	132
	4.3.2.4	Followed	137

4.4 Similarities and differences between the Geo-mobility styles 138
4.5 Chapter summary 141

Chapter 5: Offence behaviour 145
5.1 Introduction 145
5.1.1 Models of rape behaviour 145
5.1.2 Pertinent studies 147
5.1.2.1 Summaries of studies 147
5.1.2.2 Recurring behavioural themes 149
5.1.2.2.1 Criminal behaviours 149
5.1.2.2.2 Sexual behaviours 150
5.1.2.2.3 Violent behaviours 151
5.1.3 Rationale and research questions 151
5.2 Method 152
5.2.1 Sample 152
5.2.2 Procedure 153
5.2.3 Analysis 153
5.2.3.1 Content analysis 153
5.2.3.2 Development of the coding dictionary 154
5.2.3.3 Coding behaviours 155
5.2.3.4 Variables for use in Smallest Space Analysis 158
5.2.3.5 Smallest Space Analysis 160
5.2.4 Hypothesised regions 161
5.3 Results 165
5.3.1 Percentages of behaviours 165
5.3.1.1 Control violence 169
5.3.1.2 Vaginal penile 171
5.3.1.3 Confidence approach 172
5.3.1.4 Ordered sexual activity 174
5.3.1.5 Multiple penetrations 175
5.3.1.6 Surprise approach 176
5.3.1.7 Conditional threat 177
5.3.1.8 Fellatio 178

5.3.1.9	Ordered no noise	178
5.3.1.10	Stole property	179
5.3.1.11	Kissed	179
5.3.1.12	Physical violence	180
5.3.1.13	Threatened physical violence	182
5.3.1.14	Ejaculated	183
5.3.1.15	Self-disclosure personal	184
5.3.1.16	Multiple acts of violence	185
5.3.1.17	Weapon to scene	186
5.3.1.18	Ordered property	187
5.3.1.19	Verbal abuse	188
5.3.1.20	Disturbed	188
5.3.1.21	Threatened weapon	188
5.3.1.22	Unconditional threat	189
5.3.1.23	Anal penile	189
5.3.1.24	Non sexual questions	189
5.3.1.25	Ordered undress	190
5.3.1.26	Vaginal digital	191
5.3.1.27	Gagged hand	191
5.3.1.28	Condom	191
5.3.1.29	Rummaged	192
5.3.1.30	Ordered no report	192
5.3.1.31	Self-disclosure lie	192
5.3.1.32	Victim arousal	193
5.3.1.33	Multiple offenders	194
5.3.1.34	Ordered no look	194
5.3.1.35	Breasts	194
5.3.1.36	Complimented	195
5.3.1.37	Tore clothing	195
5.3.1.38	Blindfolded material	196
5.3.1.39	Erectile dysfunction	197
5.3.1.40	Locked in	197
5.3.1.41	Ordered redress	197

5.3.1.42	Penis testicles pubic hair touched	198
5.3.1.43	Cuddled	198
5.3.1.44	Implied knowing	198
5.3.1.45	Self-disclosure criminal	198
5.3.1.46	Ordered wait escape	199
5.3.1.47	Weapon from scene	199
5.3.1.48	Sexual questions	199
5.3.1.49	Apologised	200
5.3.1.50	Bit	200
5.3.1.51	Disguise	200
5.3.1.52	Excused or justified	201
5.3.1.53	Foreign language	201
5.3.1.54	Masturbated hand	202
5.3.1.55	Sat or laid	202
5.3.1.56	Tobacco smoked	202
5.3.1.57	Alcohol drank	202
5.3.1.58	Blindfolded hand	203
5.3.1.59	Bound	203
5.3.1.60	Endearment term	204
5.3.1.61	Joked or laughed	204
5.3.1.62	Non-alcoholic drank	205
5.3.1.63	Offered assistance	205
5.3.1.64	Television or radio	205
5.3.1.65	Cared, loved or liked her	205
5.3.1.66	Commented offender sexual arousal	206
5.3.1.67	Directed co-offender	206
5.3.1.68	Held hand	206
5.3.1.69	Liar	207
5.3.1.70	Redressed victim	207
5.3.1.71	Talked to himself	207
5.3.1.72	Allowed to leave	207
5.3.1.73	Anal digital	208
5.3.1.74	Attracted attention	208

5.3.1.75	Boasted	208
5.3.1.76	Commented penis	208
5.3.1.77	Drugs smoked	209
5.3.1.78	Gloves	209
5.3.1.79	Left weapon	209
5.3.1.80	Made phone call	209
5.3.1.81	No hear	209
5.3.1.82	Ordered comment sexual	210
5.3.1.83	Placed pad	210
5.3.1.84	Swallowed	210
5.3.1.85	Testicles in mouth	211
5.3.1.86	Scripting verbal	211
5.3.1.87	Vagina washed or cleaned	211
5.3.1.88	Cunnilingus	211
5.3.1.89	Phone smashed or wires cut	212
5.3.1.90	Meet up	212
5.3.1.91	Multiple victims	212
5.3.1.92	No speech	213
5.3.1.93	Slept	213
5.3.1.94	Switched lights off	213
5.3.1.95	Taxi called	213
5.3.1.96	Torch	213
5.3.1.97	Blitz approach	214
5.3.1.98	Cleaned teeth	214
5.3.1.99	Commented on own performance	214
5.3.1.100	Hair covered	214
5.3.1.101	Look out	214
5.3.1.102	Marry	215
5.3.1.103	Observed	215
5.3.1.104	Offered pay	215
5.3.1.105	Ordered comment non-sexual	215
5.3.1.106	Spat	215
5.3.1.107	Spat hand	215

	5.3.1.108	Stole underwear	216
	5.3.1.109	Requested help	216
5.4	A model of behaviour		216
	5.4.1	Smallest Space Analysis	216
	5.4.2	Interpretation of the Smallest Space Analysis	218
	5.4.2.1	Core behaviours	219
	5.4.2.2	Criminal region	220
	5.4.2.3	Sexual region	220
	5.4.2.4	Violent region	221
5.5	Chapter summary		222
Chapter 6: A Geo-behavioural model			226
6.1	Introduction		226
	6.1.1	The importance of context	226
	6.1.2	Previous geo-behavioural research	227
	6.1.3	Rationale and research questions	229
6.2	Method		229
	6.2.1	Sample	229
	6.2.2	Procedure	230
	6.2.3	Analysis	230
	6.2.3.1	Chi-square analysis	230
	6.2.3.2	Mapping the external variables on to the Smallest Space Analysis plot	231
6.3	Results		231
	6.3.1	Associations between Geo-mobility styles and individual offence behaviours	231
	6.3.1.1	Intruded	231
	6.3.1.2	Ambushed	235
	6.3.1.3	Abducted	240
	6.3.1.4	Followed	244
	6.3.2	Geo-mobility themes as external variables on the Smallest Space Analysis plot	249
	6.3.3	Interpretation of the Smallest Space Analysis	251

	6.3.3.1	Intruded and Criminal	251
	6.3.3.2	Ambushed and Violent	252
	6.3.3.3	Followed and Violent	253
	6.3.3.4	Abducted and Sexual	254
6.4	Chapter summary		255
Chapter 7: Offender profiling			258
7.1	Introduction		258
	7.1.1	Consistency, inter-offender variation and homology	258
	7.1.2	‘Useful’ behaviours	259
	7.1.3	Explanations of ‘usefulness’	261
	7.1.4	Rationale and research questions	262
7.2	Method		263
	7.2.1	Sample	261
	7.2.2	Procedure	264
	7.2.2.1	Spatial and offence behaviours	264
	7.2.2.2	Offender characteristics	265
	7.2.3	Analysis	266
	7.2.3.1	Examining the relationship between offence behaviour and offender characteristics	266
	7.2.3.2	Chi-square analysis	267
	7.2.3.3	Parametric and non-parametric analysis	269
	7.2.3.4	Bonferroni corrections	271
	7.2.3.5	Assessing the ability of the spatial and behavioural variables at predicting offender characteristics	271
	7.2.3.5.1	Logistic regressions	271
	7.2.3.5.2	Receiver Operator Characteristics (ROC)	271
7.3	Results		271
	7.3.1	Examining the association between spatial and offence behaviours with offender characteristics	271
	7.3.1.1	Age	272
	7.3.1.1.1	Age and Geo-mobility styles	272
	7.3.1.1.2	Age and Location type	272

7.3.1.1.3	Age and Transportation type	273
7.3.1.1.4	Age and Individual offence behaviours	273
7.3.1.2	Ethnicity	273
7.3.1.2.1	Ethnicity and Geo-mobility styles	273
7.3.1.2.2	Ethnicity and Location type	273
7.3.1.2.3	Ethnicity and Transportation type	274
7.3.1.2.4	Ethnicity and Individual offence behaviours	274
7.3.1.3	Distance travelled to Initial approach location	274
7.3.1.3.1	Distance travelled to Initial approach location and Geo-mobility Style	274
7.3.1.3.2	Distance travelled to Initial approach location and Location type	275
7.3.1.3.3	Distance travelled to Initial approach location and Transportation type	275
7.3.1.3.4	Distance travelled to Initial approach location and Individual offence behaviours	275
7.3.1.4	Distance travelled to Crime location	276
7.3.1.4.1	Distance travelled to Crime location and Geo-mobility style	276
7.3.1.4.2	Distance travelled to Crime location and Location type	276
7.3.1.4.3	Distance travelled to Crime location and Transportation type	276
7.3.1.4.4	Distance travelled to Crime location and Individual offence Behaviours	277
7.3.1.5	Burglary offences	277
7.3.1.5.1	Burglary offences and Geo-mobility style	277
7.3.1.5.2	Burglary offences and Location types	277
7.3.1.5.3	Burglary offence and Transportation type	277
7.3.1.5.4	Burglary offences and Individual offence behaviours	278
7.3.1.6	Criminal damages offences	278
7.3.1.6.1	Criminal damages offences and Geo-mobility style	278
7.3.1.6.2	Criminal damage offences and Location type	278
7.3.1.6.3	Criminal damage offences and Transportation type	279
7.3.1.6.4	Criminal damage offences and Individual offence behaviours	279
7.3.1.7	Drugs offences	279

7.3.1.7.1	Drugs offences and Geo-mobility style	279
7.3.1.7.2	Drugs offences and Location type	279
7.3.1.7.3	Drugs offences and Transportation type	280
7.3.1.7.4	Drugs offences and Individual offence behaviours	280
7.3.1.8	Fraud offences	280
7.3.1.8.1	Fraud offences and Geo-mobility style	280
7.3.1.8.2	Fraud offences and Location type	281
7.3.1.8.3	Fraud offences and Transportation type	281
7.3.1.8.4	Fraud offences and Individual offence behaviours	282
7.3.1.9	Motoring offences	282
7.3.1.9.1	Motoring offences and Geo-mobility style	282
7.3.1.9.2	Motoring offences and Location type	282
7.3.1.9.3	Motoring offences and Transportation type	283
7.3.1.9.4	Motoring offences and Individual offence behaviours	283
7.3.1.10	Robbery offences	283
7.3.1.10.1	Robbery offences and Geo-mobility style	283
7.3.1.10.2	Robbery offences and Location type	283
7.3.1.10.3	Robbery offences and Transportation type	284
7.3.1.10.4	Robbery offences and Individual offence behaviours	284
7.3.1.11	Sexual offences	284
7.3.1.11.1	Sexual offences and Geo-mobility style	284
7.3.1.11.2	Sexual offences and Location type	284
7.3.1.11.3	Sexual offences and Transportation type	285
7.3.1.11.4	Sexual offences and Individual offence behaviours	286
7.3.1.12	Theft offences	286
7.3.1.12.1	Theft offences and Geo-mobility style	286
7.3.1.12.2	Theft offences and Location type	286
7.3.1.12.3	Theft offences and Transportation type	287
7.3.1.12.4	Theft offences and Individual offence behaviours	287
7.3.1.13	Violent offences	287
7.3.1.13.1	Violent offences and Geo-mobility style	287
7.3.1.13.2	Violent offences and Location type	287
7.3.1.13.3	Violent offences and Transportation type	288

	7.3.1.13.4	Violent offences and Individual offence behaviours	288
	7.3.1.14	Distance to previous offences	288
	7.3.1.14.1	Distance to previous offence and Geo-mobility styles	288
	7.3.1.14.2	Distance to previous offence and Location type	289
	7.3.1.14.3	Distance to previous offence and Transportation type	289
	7.3.1.14.4	Distance to previous offence and Individual behaviours	290
	7.3.1.15	Mean inter-point distance	290
	7.3.1.15.1	Mean inter-point distance and Geo-mobility type	290
	7.3.1.15.2	Mean inter-point distance and Location type	290
	7.3.1.15.3	Mean inter-point distance and Transportation type	291
	7.3.1.15.4	Mean inter-point distance and Individual offence behaviours	292
	7.3.1.16	Summary of significant results	292
	7.3.2	Assessing predictive accuracy	293
	7.3.2.1	Logistic regressions	293
	7.3.2.1.1	Age	293
	7.3.2.1.2	Mean inter-point distance	294
	7.3.2.2	Receiver Operating Characteristic (ROC) analysis	295
	7.3.2.2.1	Age more than median and Condom	296
	7.3.2.2.2	Age more than median and Self-disclosure criminal	297
	7.3.2.2.3	Mean inter-point distance more than mean and Anal penile	298
7.4	Chapter summary		299
Chapter Eight: Case linkage			301
8.1	Introduction		301
	8.1.1	Summary of case linkage research	301
	8.1.2	Rationale and research questions	302
8.2	Method		302
	8.2.1	Sample	302
	8.2.2	Procedure	303
	8.2.3	Analysis	303
8.3	Results		305
	8.3.1	Descriptive analysis of the serial stranger rape sample	305
	8.3.1.1	Geo-mobility style	305

8.3.1.2 Location type 306
8.3.1.3 Transportation type 306
8.3.1.4 Distance travelled and previous spatial behaviour 306
8.3.1.5 Individual offence behaviours 307
8.3.2 Linkage analysis 311
8.3.2.1 Assessing consistency 311
8.3.2.1.1 Geo-mobility styles 311
8.3.2.1.2 Location types 312
8.3.2.1.3 Transportation 313
8.3.2.1.4 Inter-Initial approach and Inter-Crime proximity 314
8.3.2.1.4.1 Inter-Initial approach distances 314
8.3.2.1.4.2 Inter-Crime distances 315
8.3.2.1.5 Offence behaviours 318
8.3.2.1.5.1 Individual offence behaviours 318
8.3.2.1.5.2 Overall offence behaviour 318
8.3.2.1.6 Summary of assessing consistency 319
8.3.3 Predicting linkage 319
8.3.3.1 Logistic regression analysis 319
8.3.3.2 Accuracy of predictions 322
8.3.3.3 Receiver Operator Characteristics (ROC) analysis 324
8.3.3.4 Optimum decision thresholds 326
8.4 Chapter summary 327

Chapter 9: Discussion 331
9.1 Summary of main findings 331
9.2 Chapter summaries and comparisons with past research 331
9.3 Theoretical implications 338
9.3.1 The dynamic nature of the rape event 338
9.3.2 Consistency, inter-offender variation, homology 338
9.4 Other implications 340
9.4.1 Policing recording practices 340
9.4.2 Proactive interventions 341
9.4.3 Clinical management of offenders 342

	9.4.4	Risk assessment	342
9.5	Limitations and improvements		342
	9.5.1	Examining offence behaviours and offender characteristics using bivariate correlations	342
	9.5.2	The effect of alcohol and drugs	343
	9.5.3	Topographical features of the environment	343
	9.5.4	Behavioural structure of serial rape	344
	9.5.5	Data source	344
	9.5.6	Using a detected sample	344
	9.5.7	Using address data	345
	9.5.8	Using Smallest Space Analysis to examine offence behaviours	346
	9.5.9	Using logistic regression to predict offender characteristics	347

References 349

Appendices 370
Appendix 1: Abbreviations used 370
Appendix 2: Terms used 370
Appendix 3: Fictitious CRIS report 374
Appendix 4: General offence variables 375
Appendix 5: Victim background variables 375
Appendix 6: Offender background variables 376
Appendix 7: Spatial variables 378
Appendix 8: The original coding dictionary 382
Appendix 9: The final coding dictionary 389
Appendix 10: Variables used in the Smallest Space Analysis 396
Appendix 11: Descriptive statistics and Kruskal Wallis output for Age and Geo-mobility style 400
Appendix 12: Descriptive statistics and Mann Whitney U output for Age and Initial approach location type 400
Appendix 13: Descriptive statistics and Mann Whitney U output for Age and Attack location type 400
Appendix 14: Descriptive statistics and Mann Whitney U output for Age and Crime 400

location type
Appendix 15: Descriptive statistics and Mann Whitney U output for Age and Victim release location type 400
Appendix 16: Descriptive statistics and Mann Whitney U output for Age and Transportation type 400
Appendix 17: Descriptive statistics and Mann Whitney U output for Age and Individual offence behaviours 401
Appendix 18: Percentages and Chi-Square output for Ethnicity v. Geo-mobility Style 403
Appendix 19: Percentages and Chi-Square output for Ethnicity and Location Type 403
Appendix 20: Percentages and Chi-Square output for Ethnicity v. Transportation type 403
Appendix 21: Percentages and Chi-Square output for Ethnicity and Individual offence behaviours 404
Appendix 22: Descriptive statistics and Kruskal Wallis output for Distance to Initial approach location and Geo-mobility style 406
Appendix 23: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Initial approach location type 406
Appendix 24: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Attack location type 406
Appendix 25: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Crime location type 407
Appendix 26: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Victim release location type 407
Appendix 27: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Transportation type 407
Appendix 28: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Individual offence behaviours 408
Appendix 29: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Individual offence behaviours (continued) 413
Appendix 30: Descriptive statistics and Kruskal Wallis output for Distance to Crime location and Geo-mobility style 410
Appendix 31: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Initial approach location type 410
Appendix 32: Descriptive statistics and Mann Whitney U output for Distance to Crime 411

location and Attack location type
Appendix 33: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Crime location type 411
Appendix 34: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Victim release location type 411
Appendix 35: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Transportation type 411
Appendix 36: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Individual offence behaviours 412
Appendix 37: Percentages and Chi-Square output for Burglary offences v. Geo-mobility style 414
Appendix 38: Percentages and Chi-Square output for Burglary offences and Location type 414
Appendix 39: Percentages and Chi-Square output for Burglary offences v. Transportation type 414
Appendix 40: Percentages and Chi-Square output for Burglary offences and Individual offence behaviours 415
Appendix 41: Percentages and Chi-Square output for Criminal damage offences v. Abducted 417
Appendix 42: Percentages and Chi-Square output for Criminal damage offences and Location type 417
Appendix 43: Percentages and Chi-Square output for Criminal damage offences v. Transportation 417
Appendix 44: Percentages and Chi-Square output for Criminal damage offences and Individual offence behaviours 418
Appendix 45: Percentages and Chi-Square output for Drugs offences v. Geo-mobility style 420
Appendix 46: Percentages and Chi-Square output for Drugs offences and Location type 420
Appendix 47: Percentages and Chi-Square output for Drugs offences v. Transportation 421
Appendix 48: Percentages and Chi-Square output for Drugs offences and Individual offence behaviours 421
Appendix 49: Percentages and Chi-Square output for Fraud offence v. Intruded style 423

Appendix 50: Percentages and Chi-Square output for Fraud offences and Location type 424
Appendix 51: Percentages and Chi-Square output for Fraud offence v. Transportation 424
Appendix 52: Percentages and Chi-Square output for Fraud offences and Individual offence behaviours 424
Appendix 53: Percentages and Chi-square output for Motoring offences and Location type 427
Appendix 54: Percentages and Chi-Square output for Motoring offences v. Transportation 427
Appendix 55: Percentages and Chi-Square output for Motoring offences and Individual offence behaviours 427
Appendix 56: Percentages and Chi-Square output for Robbery offences v. Geo-mobility style 430
Appendix 57: Percentages and Chi-Square output for Robbery offences and Location type 430
Appendix 58: Percentages and Chi-Square output for Robbery offences v. Transportation 430
Appendix 59: Percentages and Chi-Square output for Robbery offences and Individual offence behaviours 431
Appendix 60: Percentages and Chi-Square output for Sexual offences v. Geo-mobility style 433
Appendix 61: Percentages and Chi-Square output for Sexual offences and Location type 433
Appendix 62: Percentages and Fisher's Exact output for Sexual offences v. Transportation 434
Appendix 63: Percentages and Chi-square output for Sexual offences and Individual offence behaviours 434
Appendix 64: Percentages and Chi-square output for Theft offences v. Geo-mobility style 436
Appendix 65: Percentages and Chi-square output for Theft offences and Location type 436
Appendix 66: Percentages and Chi-square output for Theft offences v. Transportation type 437
Appendix 67: Percentages and Chi-square output for Theft offences and Individual offence behaviours 437

Appendix 69: Percentages and Chi-Square output for Violent offences v. Geo-mobility style 439
Appendix 70: Percentages and Chi-Square output for Violent offences and Location type 439
Appendix 71: Percentages and Chi-Square output for Violent offences v. Transportation 440
Appendix 72: Percentages and Chi-Square output for Violent offences and Individual offence behaviours 440
Appendix 73: Descriptive statistics and Kruskal-Wallis output for Distance to previous offences and Geo-mobility style 442
Appendix 74: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Initial approach location type 442
Appendix 75: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Attack location type 443
Appendix 76: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Crime location type 443
Appendix 77: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Victim release location type 443
Appendix 78: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Transportation type 443
Appendix 79: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Individual offence behaviours 443
Appendix 80: Descriptive statistics and Welch and Brown-Forsythe test output for Mean inter-point distance and Geo-mobility style 446
Appendix 81: Descriptive statistics and Independent samples t-Test output for Mean inter-point distance and Initial approach location type 446
Appendix 82: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Attack location type 446
Appendix 83: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Crime location type 446
Appendix 84: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Victim release location type 446
Appendix 85: Descriptive statistics and Independent samples t-Test for Mean inter- 447

point distance and Transportation type
Appendix 86: Descriptive statistics and Independent t-test output for Mean inter-point distance and Individual offence behaviours 447
Appendix 87: Smallest Space Analysis of the offence behaviour of single offenders 450

LIST OF TABLES

Table 3.3.1	Percentage of stranger rape offences by time of day	77
Table 3.3.5.3a	Percentage of offences by offence type	83
Table 3.3.5.3b	Percentage of offences by offender	84
Table 3.3.5.5a	Distances travelled to previous offences (in km)	86
Table 3.3.5.5b	Mean inter-point distances travelled between previous offences	87
Table 4.2.3.2a	Extracts from a victim statement and the developing codes	110
Table 4.2.3.2b	Codes and sub-codes with definitions	112
Table 4.2.3.2c	The level of agreement for the Codes and Sub-codes	113
Table 4.3.1.9	Percentage of types of Location set	121
Table 4.3.1.10	Percentage of Types of location (public or private)	122
Table 4.3.1.11	Percentage of Types movement	123
Table 4.3.2	The Geo-mobility styles alongside the percentage of Codes and Sub-codes found within each style	126
Table 5.2.4	Hypothesised regions within which the offence behaviours are expected to lie	162
Table 5.3.1	Percentages of behaviours	165
Table 6.3.1.1a	Percentages and Chi-square output for Intruded and Criminal behaviours	231
Table 6.3.1.1b	Percentages and Chi-square output for Intruded and Sexual behaviours	233
Table 6.3.1.1c	Percentages and Chi-square output for Intruded and Violent behaviours	235
Table 6.3.1.2a	Percentages and Chi-square output for Ambushed and Criminal behaviours	236
Table 6.3.1.2b	Percentages and Chi-square output for Ambushed and Sexual behaviours	237
Table 6.3.1.2c	Percentages and Chi-square output for Ambushed and Violent	238

	behaviours	
Table 6.3.1.3a	Percentages and Chi-square output for Abducted and Criminal behaviours	240
Table 6.3.1.3b	Percentages and Chi-square output for Abducted and Sexual behaviours	242
Table 6.3.1.3c	Percentages and Chi-square output for Abducted and Violent behaviours	244
Table 6.3.1.4a	Percentages and Chi-square output for Followed and Criminal behaviours	245
Table 6.3.1.4b	Percentages and Chi-square output for Followed and Sexual behaviours	246
Table 6.3.1.4c	Percentages and Chi-square output for Followed and Violent behaviours	248
Table 7.2.3.2	Chi square tests carried out on categorical dependent variables	268
Table 7.2.3.3	Inferential tests carried out on continuous dependent variables	270
Table 7.3.1.16	Significant associations between Offender characteristics and Spatial or Offence behaviours	296
Table 7.3.2.1.1	Age	294
Table 7.3.2.1.2	Logistic regression analysis for Mean inter-point distance	295
Table 8.3.1.5	Percentage of Individual offence behaviours within the Serial sub-sample	308
Table 8.3.2.1.1	Percentage of matches of Linked and Unlinked pairings for Geo-mobility styles	312
Table 8.3.2.1.2	Percentage of matches of Linked and Unlinked pairings for Location type	312
Table 8.3.2.1.3	Percentage of matches of Linked and Unlinked pairings for Transportation used	314
Table 8.3.2.1.4.1	Median Inter- initial approach distances for Linked and Unlinked pairings	315
Table 8.3.2.1.4.2	Mean Inter- Crime Distances for Linked and Unlinked pairings	316
Table 8.3.2.1.5.1	Percentage of matches for linked and unlinked pairings for Individual offence behaviours	317
Table 8.3.2.1.5.2	Median Jaccard’s Scores for the Overall offence behaviour for	319

	Linked and Unlinked pairings	
Table 8.3.3.1	Logistic regression analysis for each aspect	321
Table 8.3.3.2	Predictive accuracy of the models	323
Table 8.3.3.3	Area under the curve scores for each consistent aspect	326
Table 8.3.3.4	Optimum decision thresholds	327

LIST OF FIGURES

Figure 2.2.3	Data selection and cleaning process	49
Figure 3.3.5.1	Number of offences per offender	82
Figure 4.3.1.3	Percentage of types of Initial approach location	114
Figure 4.3.1.4	Percentage of types of Attack location	116
Figure 4.3.1.5	Percentage of types of Crime location	117
Figure 4.3.1.6	Percentage of types of Victim release location	119
Figure 5.4.1	Smallest Space Analysis of offence behaviours	217
Figure 6.3.2	Smallest Space Analysis of offence behaviours with Geo-mobility styles as external variables	250
Figure 7.3.2.2.1	ROC curve for predictive accuracy for Age more than median, from Condom	296
Figure 7.3.2.2.2	ROC curve for predictive accuracy for Age more than median, from Self-disclosure criminal	297
Figure 7.3.2.2.3	ROC curve for predictive accuracy for Mean inter-point distance more than the mean, from Anal penile	298
Figure 8.3.3.3	ROC graphs showing AUC for aspect	324

CHAPTER ONE
INTRODUCTION

1.1 Background to the thesis

The Sapphire Command within the Metropolitan Police Service (MPS) is one of the largest specialist rape units in the world. With over 400 staff, the Command is tasked with investigating serious sexual violence and has a remit to ensure perpetrators are apprehended and victims are properly protected (MPS, 2009). Eighteen Sapphire teams operate over the 32 Borough Operational Command Units (BOCUs) of the MPS and comprise of Sexual Offence Investigation Techniques Trained Officers (SOITs) who are tasked to provide a fast response to any reported rape (MPS, 2009). In light of the recent Stern review, it is becoming increasingly important for rape teams, across the country, to offer "a combination of high-level investigation, good victim care, better intelligence-gathering and a focus on vulnerable people" (Home Office/Government Equalities Office, 2010, p.15). Therefore, teams have been tasked to gain a better understanding of the nature of rape at a police-force level. As Baroness Stern argues, "at the very least, knowing how and why rape occurs and is reported is valuable information that can teach the public and professionals alike what kind of rape comes to the attention of the police." (Home Office/Government Equalities Office, 2010, p.76). Collecting and analysing such information has huge implications for both strategic and operational policing. This doctoral study, part funded and commissioned by the Metropolitan Police Service, aims to add to the intelligence around the stranger rapes and perpetrator characteristics across London. The thesis provides a picture of the geo-behavioural nature of this offence in order to help better understand contextual influences on behaviour and to inform the specific tasks of offender profiling and case linkage.

1.2 The problem

In the United Kingdom, the Sexual Offences Act 2003 outlines that the crime of rape is committed when a person 'intentionally penetrates the vagina, anus or mouth of another person' and when that other person 'does not consent to the penetration' or that the offender 'does not reasonably believe' that the other person consents. The Act ensures that the law is equally applied to both male and female victims, as well as clarifying issues surrounding consent. The Act also includes the crime of 'Assault by Penetration' treating the penetration by other objects, other than the penis, just as seriously. In the UK, both Rape and Assault by Penetration hold the maximum sentence of life in prison

Stranger rape is carried out by a perpetrator unknown to the victim. A recent study in the UK, using levels of rape recorded by the police, indicates that 14% of recorded rapes are committed by strangers (Feist, Ashe, Lawrence, McPhee, & Wilson, 2007). Results from the 2004-2005 British Crime Survey indicate that the level of stranger rape is low compared to other forms of rape (11%, Nicholas, Povey, Walker, & Kershaw, 2005).These findings seem to indicate that attacks by strangers are rarer than the media would have us believe; however, studies examining reported stranger rape within Sexual Assault Referral Centres (SARCs) detail higher levels of offending. For example, Kerr, Cottee, Chowdhury, and Welch (2003) found that just over a half of victims admitted to a London SARC had been raped by a stranger, whilst, McLean and Balding (2002) indicate that over a third of clients referred to a SARC in Manchester had been raped by someone that was unknown to them.

Researchers have often singled out stranger rape as a separate phenomenon to study and offer key distinctions between this type of sex offence compared with those committed by an offender known to the victim (see Ullman, Filipas, Townsend, & Starzynski, 2009 for a review of the literature). Firstly, there seems to be differences between stranger and non-stranger rapes in terms of the offence behaviours exhibited. There is evidence to suggest that stranger rapes are significantly more likely to be physically violent, and cause more injury, than rapes where the victim is acquainted with the offender (Jones, Wynn, Kroeze, Dunnuck, and Rossman, 2004); other studies suggest stranger rapes are more akin to the rape of an intimate partner, demonstrating similar levels of violence and physical harm (Ruperal, 2004; Ullman et al., 2006; Feist et al., 2007) and fewer instances of verbal violence or threats (Jones et al., 2004). Research has also suggested that strangers are more likely to use weapons to harm or threaten than acquaintances (Riggs, Houry, Long, Markovchick, & Feldhaus, 2000). The types of initial approach and crime location may also differ; Ruperal (2004) found that a higher percentage of stranger-rape victims were initially approached by the offender in an outside location compared with non-stranger rapes. In terms of crime location, however, Jones et al., (2004) found that stranger rapes tended to occur more often in the victim's own home than outdoors (Jones et al., 2004), whilst rapes committed by a known offender tend to be committed more often in the offender's home (Jones et al., 2004).

Secondly, there seems to be differences between the handling of stranger-rape victims within the Criminal Justice System, compared with those who have been raped by a known offender. Studies often report that acquaintance rapes are less likely to be reported (Rabkin, 1976; Myhill & Allen, 2002) and that stranger rape cases are more likely to end in a conviction (Harris & Grace, 1999; Ullman et al., 2006). Bryden and Lengick (1997, p.1214)

explain possible reasons for this; they cite studies indicating that stranger rapes are more likely to reported and convicted because these cases are those within which the rapist has inflicted additional injuries (Lizotte, 1985).

The third key distinction between rapes strangers and non-stranger rapes is an investigative one. Whereas, an investigation into an acquaintance or intimate rape may centre on trying to establish consent, the focus of a stranger rape investigation will be, in the first instance, to apprehend the offender. The police, therefore, will need to employ different investigative techniques (for example, prioritising potential suspects) within stranger rape investigations.

1.3 Prolific offenders and Intelligence-led policing

A large proportion of crime is known to be committed by a small percentage of offenders (Blumstein, Cohen, Roth, & Visher, 1986). The UK Home Office introduced the Prolific and Other Priority Offenders Strategy (PPO) in 2004, aiming to prevent and deter, catch and convict, rehabilitate and resettle prolific offenders (Home Office, 2004a; Millie & Erol, 2006). This strategy was designed to target persistent offenders in order to reduce levels of crime. The PPO strategy was designed to operate at a local level (for example, within BOCUs) so that the police can work closely with other local agencies to identify local prolific offenders (Millie & Erol, 2006; Home Office, 2004b, 2004c, 2004d). Local intelligence was thought to be the key to identifying such offenders so that the police could stop, actively tackle, and work with offenders to reduce crime (Millie & Erol, 2006). Key to targeting, catching and convicting prolific offenders is one of the contemporary policing techniques, Intelligence-led policing.

Intelligence-led policing is a proactive policing strategy, with the objective of using intelligence gathering as a way in which to direct and manage police resources. This model has the objective of "reducing and preventing (serious) crime, and disrupting criminal activities" (Verfailllie, & Vander Beken, 2008, p.535; Ratcliffe, 2008). At a general level, intelligence-led policing drives police forces to manage intelligence in a way that ensures that the collection, evaluation, collation, analysis and dissemination of information is systematic and structured (Ratcliffe, 2002; John & Maguire, 2007). Information should be managed in an intelligence cycle, "rather than a process with a beginning and an end" with an emphasis on the collection, evaluation, analysis and dissemination of intelligence (John & Maguire, 2007, p.204).

The collection of intelligence involves managing information about reported crimes and offenders, keeping intelligence logs, using registered informants and entering into data-sharing agreements with other agencies (such as Her Majesty's Prison Service) (John & Maguire, 2007). The evaluation of intelligence should be examined by considering the reliability of the source of information, the veracity of that information, and whether intelligence should be disclosed to other agencies (such as Mental Health Trusts) (John & Maguire, 2007). The analysis of intelligence should be "a process of identifying patterns and relationships between crime data and other relevant data sources to prioritise and target police activity" (Cope, 2004, p.188, Gill, 2000). The dissemination of intelligence should involve responding to the information (from a policing perspective) in a timely manner (John & Maguire, 2007).

The National Intelligence Model (NIM; National Criminal Intelligence Service, 2000) is a paradigm that provides UK police forces with a structure around which they can effectively manage intelligence. The model "advocates a systematic procedure of gathering, storing, and analysing intelligence to support a tasking meeting that reviews problems and allocates resources accordingly" (Cope, 2004, p.191). The NIM outlines that the management of policing should occur on three levels; Level One is the management of intelligence on a local level, (BOCUs); Level Two deals with intelligence at a police force (or county) level; Level Three outlines how intelligence should be managed at a national and international level (John & Maguire, 2007).

As Merry (2000, p.229) argues, "The concept of Intelligence-led policing has thrust the crime analyst to the forefront of detecting crime". Crime analysts are tasked with adopting methods to aid both strategic and operational policing. Strategic methods include those such as identifying crime 'hot-spots' and crime trends as well as drawing up profiles of PPO offenders. Operation tasks include prioritising suspects (which can be aided by 'offender profiling', Oldfield, 1997) or linking crimes to a known or unknown perpetrator (Comparative Case Analysis or case linkage).

1.4 Offender profiling

When an offender rapes a stranger, the process of identifying a possible suspect can often be difficult and expensive. The cost of Operation Orb, the investigation that led to the capture of Antony Imiela, the serial 'M25' rapist, was estimated as costing in excess of £2.1 million, involving 350 officers at the height of the enquiry (Surrey Police, 2004). Thus, police forces are always looking for ways in which to prioritise pools of suspects in such cases.

Offender profiling has, in recent years, emerged as method of potentially assisting with this process and has certainly "attracted considerable media and academic attention" (Goodwill, Alison & Beech, 2009, p.508). In sum, offender profiling can be thought of as the way in which investigators attempt to infer the background characteristics of an offender (such as age or past offending behaviour) from actions exhibited at the crime scene (such as violent acts, verbal strategies) (Ault & Reese, 1980; Douglas, Burgess, Burgess, & Ressler, 1992; Hazelwood & Burgess, 1987; Wilson, Lincoln, & Kocsis, 1997, all cited from Goodwill et al., 2009).

As this section will outline, different approaches to offender profiling have been suggested and often, utilised within operational policing. In the U.K, police forces can request 'outside' assistance in carrying out offender profiling from registered experts in the field. These operate under the newer term for offender profiling, Behavioural Investigative Advice and, in turn are referred to as Behavioural Investigative Advisors (or BIAs) (Association of Chief Police Officers, 2006; cited from Alison, Goodwill, Almond, van den Heuvel, & Winter, 2010). BIAs offer the police investigative advice based on "fruitful, reliable, tested, and transparent evidence-based methods" (Alison et al., 2010, p.116). They also have built up methodological and investigative knowledge from working alongside the police (Sternberg & Horvath, 1999; from Alison et al., 2010). Although BIAs are often 'drafted' into investigation of serious offences, crime analysts often need to know how best to prioritise suspects. Research considering the most reliable and accurate way of predicting offender characteristics from behaviours exhibited at any crime scene can be of benefit to both BIAs and crime analysts (Alison et al., 2010).

1.4.1 Approaches to offender profiling

There have been various different approaches to offender profiling within recent years (Alison et al., 2010), aiming to classify rape behaviours within rapes and to examine how these may be related to offender characteristics.

1.4.1.1 Motivational classification systems

Motivational classification systems have been developed which aim to examine how rapists can be differentiated in terms of their internal drives. Early classification systems categorised rapists by their motivations to rape. These systems were based primarily on interviews and observations of convicted rapists within clinical settings and were closely linked to the psychopathological model of rape.

One of the first clinical classification systems differentiated male rapists in terms of whether they were motivated by sexual urges or aggression. Cohen, Seghorn, and Calmas (1969) proposed a four-fold classification system, categorising rapists as Compensatory, Displaced-Aggressive, Sex-Aggression Diffusion or Impulsive. Compensatory rapists were thought to be those who are primarily motivated by the need to act out rape fantasies and to alleviate feelings of sexual inadequacy; Displaced Aggressive rapists were those who rape in order to vent their anger against a significant other female; Sex-Aggression Diffusion offenders who rape in order to gain sadistic pleasure; lastly, Impulsive rapists were those who are not motivated by sexual needs or aggression. Instead, these are offenders who seize the opportunity to rape if it arises, perhaps while commissioning another crime.

A shift in thinking came about in the mid 1970s, when Groth asserted that rape was not just about fulfilling sexual needs; indeed, he believed that rapists were more likely to be motivated by *power* as well as aggression (Groth, Burgess, & Holmstrom, 1977). Groth (1979), therefore, proposed a four way typology that emphasises the sexual act of rape as a way in which to express inner aggression and the need to control. The Power-Assertive rapist is one who feels the need to assert power to lessen feelings of general inadequacy; the Power-Reassurance rapist, feels more specific feelings of sexual inadequacy and rapes in order to redeem their masculinity; the Anger-Retaliation offender feels aggression towards women in general and therefore will rape in order to seek revenge; the Anger-Excitation rapist will gain sadistic pleasure from acting aggressively to and by raping their victims.

As earlier motivational typologies of rapists were based on clinical observations, later models were adapted in an attempt to improve their validity and reliability. The Massachusetts Treatment Centre Taxonomic Program (MTCTP) in the USA was the first programme to empirically test these typologies. The MTC classification system (now in its third revision) was put forward by Knight (1999), based on empirical testing of larger clinical samples. The MTC: R3 classifies rapists based on the four primary motivations of Opportunistic, Pervasive Anger, Sexual and Vindictiveness. Echoing early systems, those within the Opportunistic category were impulsive and predatory; the Pervasive category described those who were primarily motivated by highly generalised aggressive feelings; the Sexual category was thought to include those who were either sadistic (driven by a fusion of sexual urges and aggression) or non-sadistic (enthused by feelings of sexual inadequacy and the need to dominate); finally the Vindictive category included those who hold deep resentment towards women. In addition to these four primary motivations, Knight (1999) proposed that additional dimensions could be used to discriminate between nine subtypes of

rapists, depending on whether they were thought to score highly on a set of eight dimensions. These are: juvenile and adult antisocial behaviour, social competence, expressive aggression, offence planning, global or pervasive anger, overt and muted sadism, sexualisation (sexual thoughts and fantasies, hostility towards women). New cases can then be assigned to one of the nine subtypes depending on how they score on each of the dimensions.

Around the same time as the MTC were trying to validate Groth's (1979) typology for the use in the clinical investigations, the FBI's National Centre for the Analysis of Violent Crime (NCAVC) were modifying the categories for use in criminal investigations (also called the Criminal Investigative Approach, Alison et al., 2010). The model was adapted in an attempt to describe the sorts of behaviours indicative of these motivations so that offenders could be classified from their actions at the crime scene. Hazelwood (1987) proposed a four-fold typology of rapists that is still used by the FBI today; the analysis of the physical, verbal and sexual actions of the offender is used to assign unknown offenders to one of these five categories; Power-reassurance, Power-assertive, Anger retaliatory, Anger-excitation and Opportunistic.

1.4.1.2 Behaviourally based classification systems

1.4.1.2.1 Differentiating offence behaviour into themes

In contrast to motivationally-based typologies, there has been a drive to produce more empirically sound classification systems for specific use in police investigations. Thus, instead of attempting to classify rapists on the basis of what may motivate them, other researchers have developed models of rape based on the systematic analysis of the offence behaviours themselves. These models were developed with the aim of complementing finding from motivational studies (Canter, Bennell, Alison & Reddy, 2003). This is often referred to as the Statistical approach (Alison et al., 2010),

Canter and Heritage (1990) developed the first behaviourally-based classification of rape by analysing 66 stranger sex offences from UK police records. They hypothesised that the analysis of the co-occurrence of offence behaviours would reveal certain ways in which the offender would interact with their victim. They found that certain offence behaviours did seem to occur together within and across crimes and these behaviours seemed to share similarities. Indeed, Canter and Heritage (1990) identified five themes, from this analysis. The first theme is that of 'Sexuality'; behaviours exhibited within this theme included vaginal intercourse and other types of sexual behaviours. Secondly, they found evidence of behaviour that were classified under the title of 'Violence and aggression.' These included

"violence used as a means of controlling the victim", "violence used but not as means to control" and "aggressive verbal behaviour" (Canter & Heritage, 1990, p.200). Thirdly, there were behaviours that were deemed to exemplify 'Impersonal, sexual gratification'. Behaviours indicative of this category included impersonal language, a blitz and surprise attack, tearing of the victim's clothes and being unresponsive to the victim's reactions. Fourth, Canter and Heritage (1990) described the 'Criminality' theme, containing behaviours that included binding, gagging, stealing from the victim and telling the victim not to report the offence. Lastly, the authors found empirical support for behaviours that were all indicative of 'Interpersonal intimacy.' These included the offender complimenting the victim, apologising for his actions and asking the victim questions about herself.

These themes seem to reflect the various psychological themes as identified by within the rape literature. All seem to have roots in theoretical models, from an arena of different perspectives and reflect the type of interaction that the offender will have within the rape situation.

Not only did Canter and Heritage (1990) highlight qualitative differences in the way in which offenders were interacting with their victims, the model suggested that there were certain focal aspects of the rape. They suggested that core offence behaviours, such as vaginal intercourse, can be seen as aspects of the rape that are often found in the majority of rapes and perpetrated by the majority of offenders. However, they were able to show, using sophisticated analytical techniques, that there were certain offence behaviours that rarely seem to co-exist with other behaviours and were performed by offenders in a minority of cases. These behaviours included when the offender apologised to or complimented the victim. Such actions, it was argued, were those which would more readily distinguish between offences.

Canter (1994) provided another example of a behavioural model of rapists' behaviour. He described how rapists could be differentiated in terms of the role they assigned to a victim. These behaviours could be differentiated in three ways, depending on how the offender sees the victim, either as a 'Vehicle', an 'Object' or 'a Person.' Within the 'Vehicle' theme, the offender uses the victim as a medium for his own benefit. For example, he may rape in pursuit of sexual gratification or the rape may be adjunct to pursuing monetary gain. Typical behaviours that could be seen within this theme would include robbery and sexual assault. Behaviours defined within this theme are thought of as being more excessively violent than those seen within the other two themes. Within the 'Object' theme, the offender treats the victim as a depersonalised object to be manipulated and controlled. Here, typical

behaviours would include gagging, binding, threatening and verbally abusing the victim. Within the 'Person' theme, the offender will treat his or her victim as a human being rather than an object and may show behaviours that indicate some kind of pseudo-intimacy. The offender will therefore be interested in his or her victim's life and may request that the victim participate verbally or physically in any sexual contact as if they were having a relationship.

Recently, Canter et al., (2003) continued to examine the behavioural structure of rape in this way and developed a similar model using victim statements from 112 British rapes. They identified a four themed model of rape behaviour where the offences could be differentiated into Hostile, Involvement, Controlling and Stealing types of behaviour. Canter et al., (2003) also used statistical techniques to examine the levels of violation within rapes; they found that these themes could vary in the types of sexual, physical and personal violation used in the offence. Sexual violation was used in a majority of the cases, then physical violation whereas personal violation was rarer and thus, could be used to more readily differentiate between offences.

Since these models have been proposed, there have been attempts to examine whether the behavioural themes found within rape offences can be linked to offender background characteristics.

A wealth of studies have been carried out to consider a) whether criminal behaviours can be differentiated into themes and b) to examine how and if these themes are related to offender characteristics within an array of different offences (for example, Canter & Fritzon, 1998 for arson offences; Woodhams & Toye, 2007 for robbery offences; Salfati & Canter, 1999 for homicide offences).

1.4.1.2.2 Examining individual offence behaviours

Canter (2000) argues that using a thematic approach to classifying offences may be more robust than adding meaning to behaviours on an individual basis. Thus, the themes are not dependent on certain behaviours being present. However, there is some debate about the practical utility of using a thematic approach to link back to offender characteristics; Goodwill et al., (2009), for example, found that individual offence behaviours were more accurate at predicting offender characteristics than were behavioural themes (Canter et al., 2003) or typologies (Knight & Prentky, 1990). Similarly, Davies, Wittebrood and Jackson (1997), have examined associations between individual behaviours and offender characteristics.

1.4.2 Evaluation of approaches

The work of the MTC and the use of clinical typologies in general helped to build theory around the motivations behind rapists' behaviour. These models can also be used to design specific treatment programmes for rapists and make decisions around forensic offender management issues such as sentencing and risk assessment (Canter & Heritage, 1990). However, as these models have been drawn up from observations and work within clinical settings with the offender present at the time, some suggest that it may be tenuous to classify an unknown absent offender based on their crime scene behaviour (Canter & Heritage, 1990).

The models derived from the FBI's Criminal Investigative approach have also been questioned on empirical grounds; for example, the Organised/Disorganised typology for classifying homicide offenders has been criticised for oversimplifying offenders' characteristics and offence behaviours into two mutually exclusive categories (Canter, Alison, Alison & Wentink, 2004).

The Statistical approach's main strength is the way in which it examines the behaviours occurring at the crime scene, rather than rapists' motivations (Canter et al., 2003). Therefore, when new cases are presented to criminal investigations, police officers and analysts have an objective framework within which to note the absence or presence of behaviours (Canter & Heritage, 1990). Also, although these classification systems are built on the analysis of offence behaviours, protagonists of this approach do not assert that the behaviours occur in a social vacuum. Indeed, Canter and Heritage's (1990) early model emphasises that rape is a form of social interaction and that the themes identified are ways in which the offender interacts with his victims. These models provide a framework that can be tested for replicability or used as a basis for further hypothesis testing (Canter et al., 2003).

A limitation of all approaches is that the models are based on detected offences; it could be that the offenders whose offences go unsolved may bear strikingly different characteristics than those who are caught (Canter et al., 2003).

A detailed examination of research studies that have sought to provide evidence for the ability to create offender profiles is discussed later within this chapter (with regards to establishing behavioural consistency, variability and homology). Before this is carried out, it is important to discuss another investigative task which faces police officers, crime analysts and researchers; case linkage.

1.5 Case linkage

The process of linking two or more crimes to a single perpetrator has long been an operational task for police officers, and more recently, crime analysts (Woodhams, Hollin, & Bull, 2007). Without DNA, fingerprint evidence or eye witness testimony to link crimes, police are tasked with linking crimes based on other aspects of the offence, such as location or offender behaviour (Bennell & Canter, 2002). This is commonly known as Comparative Case Analysis. Unsolved crimes are often compared to examine the likelihood of being committed by a common offender, or considering other crimes for which a known offender may be responsible (Grubin, Kelly & Brunsdon, 2001). The benefits of linking cases are both operational and legal (Woodhams, Hollin & Bull, 2007). Firstly, the more cases that are known in a series, the more potential evidence that could be assimilated, perhaps increasing the likelihood of apprehending (or convicting) an offender; secondly, police resources could be pooled if searching for a common offender; thirdly, knowing that an offender has behaved similarly in an offence in the past, may help to convict them of a comparable crime.

Determining which offence behaviours are consistent over a series of offences has important practical implications. Police officers, crime analysts and researchers often strive to collect a wealth of behavioural information from victim or witness statements in order to optimise the likelihood of correctly linking offences to a known or unknown offender. It has been argued that reducing the amount of variables collected for these purposes will ensure that particularly important, reliable features are recorded within information systems such as the Violent Crime Linkage Analysis System (ViCLAS) (Goodwill et al., 2009). As Bennell and Jones (2005) argue, if the police are informed about which aspects of the offence (or which combinations of aspects) may be useful for predicting whether crimes are linked, this could potentially improve case linkage strategies and prioritise resources more effectively.

In terms of research (as compared to strategies which crime analysts or the police may adopt), the broad strategy for examining case linkage (without the presence of forensic or eye-witness evidence) has been to examine the offenders' offence behaviour or *Modus operandi* (Davies, 1992; Hazelwood & Warren, 2003; cited within Woodhams et al., 2007). Researchers often examine the behavioural domain or style of offending exhibited by an offender (for example, Grubin et al., 2001; Santtila, Junkkila & Sandnabba, 2005) and/or individual aspects such as the spatial proximity of offence locations (for example, Bennell & Canter, 2002).

Generally, case linkage research has focused upon trying to establish whether offence behaviours are consistent over a series (for example, Grubin et al., 2001) and whether the

'style' or particular offence behaviours exhibited by an offender can be differentiated from the 'style' or particular offence behaviours exhibited by another offender (for example, Santtila et al., 2005). The adoption of these methods is derived from fundamental principles that form the basis of both offender profiling and case linkage; consistency and differentiation.

1.6 The fundamental principles of offender profiling and case linkage

1.6.1 Consistency and differentiation

It is widely recognised that offender profiling and case linkage are based on two fundamental principles. The first is the assumption that offenders will behave consistently within their non-offending and offending activities, across a series of crimes and across crime types. This is often known as the Offender Consistency hypothesis (Canter, 1995) or internal consistency (Green, Booth, & Biderman, 1976). Secondly, it is assumed that the actions of one offender must vary, in some way, from that of another offender. If all offenders behaved in the same manner, there would be no way of distinguishing between them. This is often known as differentiation (Canter, 2000), inter-offender variation (Goodwill & Alison, 2007) or distinctiveness (Woodhams & Toye, 2007) or external consistency.

Offender profiling is not possible without some element of consistency between the offender's criminal and non-criminal life. Therefore, and as Canter (2000) argues, the offence behaviours will be extreme examples of the sorts of behaviours offenders will exhibit towards others when carrying out daily non-criminal life. So, offenders who use particular verbal strategies within their everyday language (for example, a term of endearment) will also use these strategies within their offending life (so, referring to a rape victim with this particular term of endearment). In this way, the offender's background characteristics are linked to their offence behaviour.

Similarly, case linkage is not possible without a level of behavioural consistency. If offenders did not, in some way, behave similarly across a series of crimes, then it would be impossible to link their offences together on the basis of their *Modus operandi*.

The tenet of inter-offender variation works in the same manner for both offender profiling and case linkage. If all offenders behaved in the same way across the same crime type, either in a 'one-off' offence or across a series (for example, using a term of endearment to refer to a rape victim), then there would be no way of discriminating between offenders on the basis of these behaviours, either to infer their background characteristics or to be relatively certain that two crimes were linked to a particular offender.

Theoretical models and research from the arena of personality psychology have set the framework for ideas about consistency and differentiation within criminal behaviour. Before the 1970's, personality theory was predominately concerned with the 'trait' approach, emphasising that individuals possess certain dispositions towards behaviours. Theorists believed that these predispositions were consistently exhibited in some form across different types of situations and that it was possible to predict an individual's behaviour in new, unobserved situations (Allport, 1937). The emphasis of the situational effect on behaviour was minimal; although the literature suggested that behaviour can be influenced by the situation within which it is exhibited, this influence is independent of personality. Shoda (1999) illustrates this point by citing the example of the trait "friendliness": "…people are usually less friendly with strangers than with acquaintances, but according to this model a "friendly" person's behaviour should be still friendlier when compared to the behaviour of other people, even when they are with strangers." (p. 157). Therefore, this model of personality considers that individuals will possess a base level of a trait such as friendliness that will vary across situations but will not be extinct (Shoda, 1999). Trait theorists, therefore, did not deny the existence of the situational influence on behaviour; indeed, Allport (1937) suggested that the extent to which a stable trait was exhibited did fluctuate from time to time. In summary, protagonists of this approach believe that the notion of consistency is important when analysing behaviour as it implies that behavioural style is determined more by psychological or personality factors than situational variables.

Since Mischel (1968), contemporary personality researchers have criticised the underestimation of the influence of situation on behaviour. Notably, such researchers have argued against the notion of personality consistency, suggesting that empirical evidence shows high cross-situational variation in behaviour (Mischel, 1968; cited in Pervin, 1986). Mischel (1968) concluded that traits such as aggression are not as consistent as the original trait theorists had once thought. Alison, Bennell, Mokros, and Ormerod (2002) summarise other criticisms of the trait approach, including evidence that situational influences or person-by-situation interactions can explain cross-situational variations in behaviour (Bowers, 1973) and criticism of the basic theory behind the entire trait approach (Bandura, 1969; Cervone & Shoda, 1999a) (all cited in Alison et al., 2002).

In response to such criticism, trait theorists suggested various reasons for the lack of empirical evidence for the consistency of personality (Pervin, 1986). These included methodological reasons such as the inadequacy of measures and poor experimental design; individual differences; the variation of situations (summarised within Pervin, 1986). Many

trait theorists have thus conducted experiments to counteract such shortfall and have found some empirical evidence to suggest that cross-situational consistency is much higher than Mischel (1968) suggested (Epstein, 1980). Similarly, proponents of the consistency model have also found evidence to suggest that behaviour can be consistent over time (Block, 1977).

Although there has been great debate over the consistency of personality, it is agreed that situational factors do, to some extent, influence behaviour. Another alternative, postulated by contemporary theorists, is that behaviour results from the interaction between person and situation (Magnusson & Endler, 1977). In essence, the combination of both entities determines the behaviour of individuals – neither personality nor situation solely determines one's actions. This notion suggests that there are possible ""if…then" relations between clusters of behaviours and clusters of situations" (Mischel, 1990; Wright & Mischel, 1987a, cited in Alison et al., 2002, p.16). This contingency-based representation can therefore account for cross-situational variations in behaviour (Shoda, 1999). As Woodhams et al., 2007) explain, researchers have presented the idea that internal mechanisms, such as a 'cognitive affective personality system' (CAPS) (Mischel & Shoda, 1995) influence cross-situational behaviours. Such systems are made up of goals, motivations and cognitions that can be activated by external or internal triggers (Woodhams et al., 2007). When an individual is presented with a situation that bears psychological similarity (Shoda, 1999) to a previous situation, they are more likely to adopt a behavioural strategy that they have used before (Mischel, 1999). Greene (1989) posits that the more the person comes across a similar situation and, thus behaves in a particular way, the more likely that behaviour is likely to reoccur in the future.

This mechanism also explains how differentiation may occur. If such systems as CAPS are formed on the basis of an individual's own internal cognitions and emotions, and these have been moulded by experience (the exposure to particular situations), the individuals will elicit different behaviours in different situations.

These mechanisms give an insight into how some behaviours across similar and different crime types can be consistent and how different offenders may behave uniquely in different situations (hence, variability between offenders). As Woodhams and Toye (2007, p.62) suggest "when people encounter situations that have greater psychological meaning to them, they produce similar behaviour."

1.6.2 Homology

A tenet particularly relevant for offender profiling is the 'homology' assumption. Alison et al., (2002) outline how, if one is to infer particular background characteristics from offence behaviours, individuals who behave in the same kind of way within a crime must share similar background characteristics. For example, if an investigator concluded that offenders who were especially violent to a victim within a rape are likely to have a previous conviction for a violent offence, it would have to be the case that many offenders who behaved in such a way would all have a similar, violent conviction. Mokros and Alison (2002) also argue that homology has no theoretical basis. As this chapter will detail, support for homology is varied.

1.7 Research considering behavioural consistency

This section outlines pertinent studies in the area of behavioural consistency. There has been a wealth of recent research examining behavioural consistency in offending behaviour and whether specific behaviours or behavioural themes are more consistent than others. These studies consider such behaviour within less violent crime types such as burglary (Markson, Woodhams, & Bond, 2010), car theft (Tonkin, Grant, & Bond, 2008) to more serious, violent offences such as robbery (Woodhams & Toye, 2007), homicide (Salfati & Bateman, 2005) and sexual offending (Grubin et al., 2001; Santtila, Junkkila & Sandnabba, 2005). The methods also examine whether offenders will be consistent at a general level (for example the specific type of offence they commit), whether they will be consistent at a thematic behavioural level (that is, the type of behaviour exhibited), or whether they will be consistent in the precise, individual behaviours they will perform. The following discussion will outline examples of studies of consistency using this framework in mind.

At a general level, there has been some evidence of consistency within sexual offending; Soothill, Francis, Ackerley, and Fligelstone (2002) found that a small percentage of offenders who had been convicted of a serious sexual offence had a sexual conviction in their offence history. Other researchers have reported evidence of offenders specialising in particular types of sexual offending such as choosing particular victims. Sjöstedt, Långström, Sturidsson, and Grann (2004) examined the recidivism details of 1303 offenders released from a Swedish prison from 1993 to 1997 to explore whether offenders were consistent in terms of their victim choice, offence nature and severity of the offence. Using Cohen's kappa and odds ratios they measured the level of agreement between these aspects within the offenders' index offence (the offence they had been imprisoned for) and any re-offences.

They found that there was a high level of agreement in terms of the victim choice of the offenders; the chance of an offender assaulting a male in their re-offence was 180 times more likely if they had offended against a male in their index offence compared with those who offended against a female in their index offence. Similarly, if the victim was a child within the first offence, an offender was 17 times more likely to reoffend against a child compared with someone who had not committed an offence against a child in the first instance. Other such results include the victim choices of family or other relatives (27 times more likely) and of strangers (nine times more likely).

Although there is some evidence to suggest that sex offenders are consistent in their victim choice and 'type' of sexual offending, others have found that, in fact, a great deal of these offenders have a general offending background. Harris, Smallbone, Dennison, and Knight (2009) outline a body of research that has found that sex offenders often have an array of different types of offences within their background; for example, Smallbone, Wheaton and Hourigan (2003) found that over two-thirds of rapists within their study had previous convictions for other non-sexual offences, often with prolific violent histories. Even within the Soothill et al., (2002) study, they found that that 50% of their sample had a previous conviction for violence. Some sex offenders are often thought to be generally 'anti-social' (Hanson & Morton-Bourgon, 2005), they are likely to have a lifestyle or have qualities that are disruptive, reckless or impulsive (Rice, Hauls, & Quinsey, 1990), with tendency for illicit substance abuse (Looman, Abracen, DiFazio, & Maillet, 2004) and a history of delinquent behaviour (Davis & Leitenberg, 1987). Indeed, Weinrott and Saylor (1991) found that even victim choice was not consistent; sex offenders seemed to commit crimes against both strangers and non-strangers.

Many studies have examined behavioural consistency in the types, domains or themes of behaviour exhibited across series of both non-sexual and sexual offences, with varying results. Salfati and Bateman (2005), for example, examined consistency in serial homicide. Using cases derived from the database held at the Homicide Investigation and Tracking System (HITS) in the USA, the researchers studied behavioural themes of Expressive and Instrumental aggression found in their sample (derived from multidimensional scaling) and showed that, to a degree, offenders were fairly consistent in the type of aggressive theme they exhibited throughout three offences.

Woodhams and Toye (2007) studied behavioural consistency in aspects of 80 solved commercial robberies recorded from 1998-2003 from a UK police force. They compared the crime scene behaviours of pairs of crimes that had been committed by the same offender

('linked' pairings) with pairs of crimes that were not committed by the same offender ('unlinked' pairs). Comparing pairs of linked crimes with pairs of unlinked crimes, they found that linked offences exhibited a significantly greater level of consistency across pairs than unlinked offences, in the behavioural domains of target selection (such as type of premises, time of day), planning (for example, wearing a mask) and control (such as the use of weapons to control).

In a similar study, Tonkin et al., (2008) examined 193 vehicle thefts series to consider whether particular behavioural domains were consistent across offences. Findings suggested that target selection choices (such as the type and age of car, and temporal aspects such as time of day), target acquisition behaviour (such as method of entry and method of starting the car), disposal behaviour (such as property stolen from within the vehicle and the recovery state of the car), as well as overall offence behaviour were significantly more consistent across pairs of crimes that were linked to a common offender, compared to pairs of crimes that were not linked to a common offender.

More recently, Markson et al., (2010) examined behavioural similarity within 80 pairs of linked residential burglary recorded with a UK police force between 2006 and 2008. Comparing behaviour exhibited across these crimes with 80 pairs of unlinked offences, they found that linked offences were significantly more consistent in overall offence behaviours exhibited, inter-crime proximity (distance between linked offences) and temporal proximity (number of days between offences) than unlinked offences.

Other studies have examined the relative consistency of particular behavioural domains compared with others. By considering particular behavioural domains within sexual assaults and rape, Grubin et al., (2001) examined 468 offences committed by 210 serial offenders on a UK database committed between 1965 and 1993 as well as 102 offences committed by 36 offenders from the database ViCLAS (which was maintained by the Royal Canadian Mounted Police). One of the main aims of this study was to examine whether behaviours within these domains and domain types were consistently exhibited across a series. The domains considered were; Control (methods that the offender used to control the victim), Sex (the sexual behaviours exhibited within the crimes), Escape (behaviours that indicated that the offender was concerned about a safe escape) and Style (behaviours that related to the own personal style of the offender). By performing cluster analysis, Grubin et al., (2001) found that each behavioural domain could be broken down into different types of co-occurring behaviours. For example, the Control domain contained behaviours that were 1) opportunistic, a car was used, the victim was moved and a weapon may have been moved, 2)

opportunistic, a surprise approach was used, 3) behaviours similar to type 2 but the offender was not a prowler and no weapon was used, and 4) planned, an indoor crime location, a surprise approach was used and a weapon was present. Within all four domains, 30 behaviours had been identified and there were 256 possible combinations of the various domain types for each offence (Grubin et al., 2001, p.15).

Consistency within this study was established if there were repeated occurrences of combinations of behaviour both across domain type (two or more of the domains, referred to as 'multi-domain consistency') as well as over one domain type ('single domain consistency') (Grubin et al., 2001). The researchers found that consistency was established; for serial offenders within the UK database, 83% of offenders were exhibited single domain consistency and 26% showed consistency in all four domains. The most consistent domains were found to be Control and Escape, whilst less consistency was established for Sex and Style domains.

Others have examined behavioural consistency at an individual behavioural level. As part of a wider study, Santtila et al., (2005) examined behavioural consistency across a sample of 43 stranger rape offences committed in Finland from 1983-2001. To examine behavioural consistency, they examined the presence or absence of particular offence behaviours across two selected rapes within a series using cross-tabulations. The frequencies of all present-present and absent-absent combinations were calculated and those variables that were considered consistent (less than six inconsistencies across the two crimes) were put forward for further analysis. These consistent behaviours included a confidence method of approach, more than one penetration, the offender revealing information about himself, manual gagging of the victim, revealing the victim's breasts, threatening the victim not to report the offence, the offence being committed at night, the offence being committed in an apartment, if the crime site was outdoors, and if the crime site was a park or bushes.

1.8. Research considering inter-offender variation and assessing predictive accuracy

Again, this section summarises pertinent studies in this area. Bennell and Canter (2002) were the first researchers to consider the diagnostic tool of Receiver Operator Characteristics (ROC) analysis to examine the decision making process in case linkage (this method is discussed within Chapter Two). By examining 43 serial burglaries against commercial properties recorded within 1999-2000, from a large UK police force, they considered how accurate particular behavioural aspects of the offences were at distinguishing between linked and unlinked pairs of crimes. The researchers examined the entry behaviours,

target selection choices, property stolen and internal behaviours exhibited within the offences. They also examined a particular aspect of the offenders' spatial behaviour, namely the distances between two linked offence locations. They predicted that linked offences would be significantly closer together than unlinked offences (inter-crime proximity) and that offence behaviours would be more similar (measured using the Jaccard's coefficient) within crime series.

Using logistic regression to examine the ability of each behavioural domain to reliably discriminate between pairs of linked and unlinked offences, Bennell and Canter (2002) found that all behavioural domains could accurately do so. However, when comparing each against each other, inter-crime proximity was the most accurate predictor of case linkage followed by entry behaviours, target selection choices and property stolen. The researchers also examined all behavioural domains within a forward stepwise logistic regression model to consider which, in combination, would most accurately predict linkage. Bennell and Canter (2002) found that inter-crime distances and entry behaviours formed the basis of such an 'optimum model.'

Bennell and Canter (2002, p.152) went on to demonstrate "the degree to which features of an offence may help to link that offence to others committed by the same offender." They did so by employing the diagnostic tool of Receiver Operator Characteristics (ROC) analysis to assess the comparative ability of the behavioural domains to accurately predict linkage and "to assign each behavioural feature an overall level of predictive accuracy"

They found that all behavioural domains predicted case linkage at a level that was better than chance, but, again, inter-crime distance was the most accurate predictor. Using ROC analysis, however, the next most accurate behavioural domain was target selection, followed by entry behaviours and property stolen.

Bennell and Jones (2005) extended the work of Bennell and Canter (2002) by examining the predictive accuracy of using particular aspects of offenders' MO to link 517 serial commercial burglaries and 51 residential burglaries. Bennell and Jones (2005) examined four features within offences; namely, entry behaviours, target characteristics, items stolen and the distance between offences to consider whether these features could be accurate used to link offences. Using the same technique as Bennell and Canter (2002), Bennell and Jones (2005) compared pairs of linked crimes (offences that were known to be committed by the same offender) with pairs of unlinked crimes (randomly selected offences that were known not to be committed by the same offender, drawn from the original sample).

Linked and unlinked pairs of crimes were compared with each other to examine a) whether the features of the offences were significantly more consistent within the linked pairs of crimes than within the unlinked pairs of crimes, b) the extent to which these features could be used to discriminate between linked and unlinked pairs of crimes and c) the most accurate predictor of case linkage.

Adopting logistic regression and ROC analysis, Bennell and Jones (2005) found that both commercial and residential burglars showed consistency in entry behaviours, target characteristics, and items stolen as well as showing that the distances between linked pairs were consistently shorter than those between unlinked pairings. In relation to establishing whether the features of linked pairings were different from unlinked pairings, it was found that the inter-crime distance was more effective at discrimination than entry behaviours, target characteristics and items stolen. Offences committed by the same offender were significantly closer together than those committed by different offenders.

Bennell and Jones (2005) also examined a way in which to establish the optimum decision thresholds within ROC. ROC allows the user to examine the point at which the 'best' decision can be made, minimising the probability of a false alarm and maximising the probability of a correct decision (a hit) or a "correct rejection". Using Youden's Index, the researchers were able to identify the precise distance between pairs of crimes which could most accurately predict linkage (for more information on optimum decision thresholds and Youden's Index, please see Chapter Two).

Bennell and Jones (2005) also found that optimal thresholds for commercial burglaries were larger than those for residential burglaries. Therefore, offence locations within commercial burglaries were slightly further apart; burglars were travelling further between these offences (perhaps because the targets of commercial burglaries are more widely, spatially dispersed).

The Markson et al., (2010) study provided a replication of the Bennell and Canter (2002) and Bennell and Jones (2005) studies by examining inter-offender variation and predictive accuracy using residential burglaries. They also found that inter-crime distances could most readily differentiate between linked and unlinked crime pairs, and found that temporal proximity was also an accurate predictor of case linkage (measured by the number of days between offences), whilst they found that the behavioural domains of property stolen, entry behaviours and target selection and the domains combined did not reach an acceptable level of predictive accuracy. They concluded that future research must use data derived from

different geographical areas in order to further establish those behavioural domains that best predict case linkage.

In their study examining serial robbery, Woodhams and Toye (2007) also found evidence of inter-offender variation. Adopting the same technique as Bennell and Canter (2002) and Bennell and Jones (2005), they examined whether particular behavioural domains could be used to differentiate between pairs of linked and unlinked offences. Considering all domains separately, they found that the control domain was the most accurate predictor of case linkage, followed by inter-crime distance, target selection and then planning. Woodhams and Toye (2007) also noted that using the control, planning and inter-crime distances together produced an optimum model that was most accurate at predicting linkage.

Bennell, Jones and MeInynk (2009) examined the methodological advantages of using ROC analysis as a predictive tool to link serial rape cases together. The researchers used a sample of 126 rape offences committed by 42 offenders (having committed three offences each) which had been reported to UK police force. Considering 27 offence behaviours derived from the police records, Bennell et al., (2009) explored whether linked rapes were behaviourally similar compared with a derived sub-sample of unlinked rapes. They found that offences committed by the same offender were significantly more similar, in terms of their overall offence behaviour (measured using Jaccard's similarity measure) than those committed by the same offender and concluded that this was evidence to support the notion that serial offenders did indeed show a level of behavioural consistency and distinctiveness. However, the authors noted that the spread of distribution of Jaccard's scores between offences carried out by the same offender was quite wide and that some offenders did not show high levels of behavioural similarity across offences. Bennell et al., (2009) argued that it would therefore be difficult to establish whether offences were linked to the same offender using the Jaccard's score alone and that, potentially, this could lead to the 'incorrect' decision being made. The authors therefore supported the use of ROC analysis (and the 'Area under the Curve' statistic) to establish "the degree to which it is actually possible to discriminate between crimes committed by the same offender versus different offenders..." (Bennell et al., 2009, p.302).

Bennell et al., (2009) then went on to examine the predictive accuracy of the Jaccard's scores using ROC analysis. They found that overall behaviour yielded an AUC value of 0.75 which is considered a good level of predictive accuracy (Swets, 1988). Hence, Bennell et al., (2009) concluded that using behavioural similarity scores, it was possible to predict, to a good level of accuracy, whether offences had been committed by the same offender.

Using a different methodology, Santtila, Fritzon, and Tamelander (2005) examined the ability of behavioural themes in arson offences to predict whether a pair of crimes were linked or not. Adopting principal component analysis, the researchers examined the behavioural nature of 42 series, committed between 1991 and 2001 in Finland. They found that behaviours could be differentiated into factors of Expressive Person, Instrumental Person/Destroy, Expressive Object, and Adaptive. Using discriminant function analysis, Santtila et al., (2005) found that 33% of offences could be correctly linked together on the basis of the behavioural factors.

In the Santtila et al., (2005) study examining rape series, they examined the effectiveness of predicting case linkage through underlying behavioural themes. After establishing which individual behaviours were most consistent across crime pairs by cross-tabulations, the researchers used Chi-square analysis to establish whether inter-offender variation could be established (that is, a significant result was said to determine this). Behaviours that were established to be both consistent and which exhibited inter-offender variation were then selected for multi-dimensional scaling analysis, in order to be differentiated into themes. These themes were found to be the following; Involvement (expressive) which consisted of variables such as removes clothing to reveal breasts, threatens the victim not to report the rape and reveals information about himself; Involvement (deceptive) containing such variables as adopting a confidence approach, targets victims who are intoxicated; Sexual (hostile) which was made up of variables such as the crime location being an outdoor setting, the offender penetrating the victim more than once; Physical (hostile) where the offender rapes the victim outdoors, gags, and/or wounds the victim. Another multi-dimensional scaling analysis was carried out using the cases (instead of variables). Proximity scores between any two cases were used as a way of establishing linkage. All cases were examined individually and the five closest (using the proximity calculation) were considered to see whether they were linked to the particular case. Santtila et al., (2005) found that, within 40% of the cases, a linked case was found within this closest five offences. When examining the 10 closest, it was found that a linked case was detected in over 60% of cases.

Yokota, Fujita, Watanabe, Yoshimoto and Wachi (2007) examined how accurate an ‘investigative support system’ was a predicting whether serial sex assaults were linked together. The researchers considered the offence behaviours (the whole sample had 91 offence behaviours in total) of 868 offenders who had committed a sex offence (rape and

indecency). Within these 868 offenders, there were 188 offenders who had committed more than one offence. If the offender had committed at least three offences, the researchers removed the most recent offence and called this a 'target incident' (Yokota et al., 2007, p.845). Within this new target database, there were 81 offenders having committed 81 offences. They then calculated the behavioural similarity score, a probability score (see Yokota et al., 2007 for calculation of the algorithm) between each offender (out of the 868) in the database and the 81 target incidents. For each target incident, each offender was ranked in terms of how high their probability score was in comparison to the incident. This was carried out 81 times (81 'trials'). If the offender who had actually committed the offence had a lower ranking, the more accurate the test was thought to be.

Yokota et al., (2007) found that in 24 of the 81 trials, the correct offender was identified with a ranking of 1. They concluded that in 29.6% of all trials, the correct offender was identified as carrying out the offence. In conclusion, the authors found that overall offence behaviour was a good measure for differentiating between offenders and for predicting whether serial sexual assaults were linked.

The examination of inter-crime proximity as a useful tool for predicting linkage has been under-researched within the examination of rape offences. An exception is Grubin et al.,'s (2001) study, where the researchers showed that spatial information on the crimes (inter-crime distances) improved linking accuracy (after having used behavioural information).

1.9 Research considering homology

Much research has been carried out to establish whether offenders' offence behaviours are related to their background characteristics. Generally, researchers have either examined whether behavioural themes or domains, or individual behaviours, are useful in predicting or can be significantly associated with thematic models of or individual offender characteristics. Some of these studies have found some evidence that offenders who exhibit particular offence behaviour share similar background characteristics (known as homology) (for example, Warren, Reboussin, Hazelwood, & Wright, 1991; Davies et al., 1997; Canter & Fritzon, 1998; Häkkänen, Lindlöf, & Santtila (2004). Other studies (such as Mokros & Alison, 2002; Scott, Lambie, Henwood, & Lamb, 2006; Woodhams & Toye, 2007) have not drawn the same conclusions. One study (Goodwill et al., 2009) has examined the comparative accuracy of Canter et al.,'s (2003) model of stranger rape, the MTC (Knight, 1999) and

individual offence behaviours at predicting offender characteristics. This section will discuss the findings of these studies.

Research has often examined how behavioural themes exhibited within offences can be related to offender background characteristics. Canter and Fritzon (1998) examined a sample of 175 detected arson offences reported to five police forces in England to consider whether a) the behaviours exhibited could be differentiated into themes, b) the characteristics of the offenders could be differentiated into themes and c) whether there was an association between the behavioural and characteristic themes. Using multi-dimensional scaling, the researchers found that the 42 offence behaviours could be separated into four themes. These were: Expressive person, characterised by behaviours which could be motivated by a need to "restore emotional equilibrium, or alleviate distress by seeking attention from family or the authorities" (Canter & Fritzon, 1998, p.82); Instrumental person, which included fire-setting behaviours aimed at seeking revenge against another person; Expressive object, which was exemplified by behaviours aimed at expressing anger or emotion against a particular building (which could be a symbol of something to which the offender feels resentment or rage); Instrumental object, which included behaviours which were thought to signify opportunism and to be associated with general delinquent and criminal behaviour.

Canter and Fritzon (1998) then examined how particular offender characteristics (such as relationship status, mental health background, employment, gender and ethnicity) could be differentiated into themes, using MDS analysis as before. They found the following themes: Young offender, which were a set of younger offenders who were still at school and lived with their parents; Repeat arsonist, a group of offenders who had a background of fire alarm hoaxes and who had been previously been reported for arson-related behaviours and who were mostly women; Psychiatric history, offenders who had a history of mental health problems such as depression and psychosis and who had made threats of or attempted suicide; Failed relationship, comprised of offender variables such as alcoholism, cohabitation, married, separated, divorced and unskilled employment.

Correlations between scales derived from the two MDS outputs showed that there were significant associations between particular behavioural themes with particular characteristics themes. The Instrumental object theme correlated significantly with the Young offender theme, showing that younger, delinquent offenders were opportunistically setting fires as part of a general anti-social repertoire. The Expressive person theme correlated significantly with the Psychiatric theme, demonstrating that people with a history of mental health problems were setting fires that seemed to be a way of expressing themselves or

alleviating distress. The Expressive object theme was significantly associated with the Repeated arsonist, suggesting that offenders who committed arson as an act against authority were also known to have been continually setting fires and making false alarms. Lastly, the Instrumental person theme was significantly related to the Failed relationship characteristic theme suggesting that these offenders were setting fires in an attempt to seek revenge for the break-down in their relationships. In summary, this study showed that, within this sample of arson, homology could be established.

A similar method was used by Häkkänen et al., (2004) in their study examining the behavioural nature of 100 stranger rapes in Finland between 1992 and 2001. Again, using multidimensional scaling (MDS), they found that offence behaviours and offender characteristics could be differentiated into different themes; those that represented underlying Hostility (for example, overt aggression), Involvement (that is, pseudo-intimate behaviours) and Theft (behaviours that were indicative of an instrumental motivation to steal). The researchers then used the same MDS technique to differentiate offender characteristics into themes. They found that offenders could be discriminated into four themes; namely, Psychiatric/Elderly (retirees, aged over 50 years, a psychiatric patient), Criminal/Property (a student, criminal histories of offences such as theft), Criminal/Violent (with a criminal history of rape, assault), and Conventional (those with a 'normal' background, such as being married, divorced, with children). The researchers than assigned each offence into one (or none) of the behavioural themes or to a hybrid theme (for example, Hostility and Involvement), and assigned each offender into one (or none) of the characteristic themes or to a hybrid theme (for example, Conventional and Criminal/Violent). By examining the proportion of actions in each of the three behavioural themes against the proportion of characteristics within each characteristic theme, the researchers only found a significant correlation between the behavioural theme Theft and the Criminal/Property characteristic theme. A similar significant result was found when comparing the behavioural and characteristic themes using cross-tabulations and Chi-square analysis. Häkkänen et al., (2004) concluded that any inferences made about offender background characteristics from offence behaviour should be treated with caution and emphasised the need to consider the influence of context on behaviours exhibited at the crime scene.

Alongside studies that have examined whether there are any associations between behavioural and characteristic themes, other researchers have examined whether individual offence behaviours can be linked to offender characteristics. Researchers who have found evidence for homology include Warren, Reboussin, Hazelwood and Wright (1991). These

researchers from the Criminal Investigative Approach to offender profiling examined both offender interviews and victim reports from 73 rapes committed by 41 incarcerated serial rapists from the USA. They found that they could code offence behaviours according to 33 verbal, physical and sexual behavioural scales and that results from these scales could be used to predict whether the offender had increased in violence over their crime series ('increasers') or decreased in violence over the series ('decreasers'). Notably, the authors found that increasers exhibited a higher level of planning within their offences (such as binding and transporting their victims). Such a study highlights ways in which offender background characteristics (such as level of aggression) can be predicted from behaviours exhibited at the crime scene. However, the study may not have great operational use; if a police officer notes evidence of planning in an offence, this may indicate that the offender is an 'increaser.' As discussed previous though, there is evidence to suggest that many offenders are not serial sex offenders (Simon, 1997) and the knowledge that someone has increasing levels of aggression across an offence series does not relate directly to the offender's characteristics. Thus, the practical utility of finding such homology is limited.

Davies et al., (1997) carried out a study which may have more useful findings. The researchers examined a sample of 210 rape and serious sexual assault cases, derived from 33 police forces (the majority of which were from the Metropolitan Police Service), that had been committed between 1965 and 1993. Davies et al., (1997) found that specific individual offence behaviours were useful in predicting offender characteristics. The calculation of odds ratios was used to examine how accurate behaviours were at predicting particular offender characteristics. They found that if the offender had taken finger print precautions, they were four times more likely to have a conviction for burglary, whilst those offenders who had not taken such precautions was three times more likely to be a one-off (as opposed to serial) rapist. Other forensic considerations were also powerful indicators of offending history; if the offender had destroyed his semen at the scene, he was approximately four times more likely to have a previous sexual offence conviction than an offender who did not destroy his semen. Again, another forensic precaution was also found to be useful; this time, if the rapist had not taken precautions concerning the victim seeing his face (for example, he did not wear a disguise), he was approximately three times more likely to be one-off offender than a serial offender.

Not only did Davies et al., (1997) show that particular offence behaviours could be used as predictors of specific background characteristics that would be useful markers for

suspect prioritisation (that is, the police could examine PNC records in order to filter suspects), this study showed how practically useful odds ratios were at measuring this.

Findings evidencing homology are mixed however; Mokros and Alison (2002) found "no evidence for the assumption of a homology between crime scene actions and background characteristics for the rapists" within their sample (p.25). The researchers examined 28 offence behaviours of 100 (later reduced to 92) rapists from a sample drawn from the UK and used these to form the basis of an MDS analysis. These authors did not use this method to differentiate the behaviours into themes, as other have done. Instead, they used the MDS output as "a topographical behavioural map that comprised the content universe of offending styles" (Mokros & Alison, 2002, p.34). They calculated the 'centroid measure' for each of the behaviours (variables), this measure being one that indicated the relative placement of the variables within the MDS plot (for more information on the calculation of this measurement, please see Mokros & Alison, 2002). The researchers then calculated the overall centroid calculations for each of the offenders' overall offence behaviour.

To examine the homology assumption, Mokros and Alison (2002) examined whether the offender characteristics of offenders with close overall centroid measures were similar. They examined the offender characteristics of age, socio-demographics (such as ethnicity, employment, educational qualifications, whether the offender had been in prison previously) and previous criminal convictions (such as theft, burglary, violence, previous sexual offences) to see if offenders with similar background characteristics were close to each other in terms of the centroid. The authors found that there was no relationship between this proximity and the offenders' ages, previous convictions and socio-demographic features. The authors concluded that such findings have important practical and theoretical implications for the prediction of offender behaviours from background characteristics, especially those drawn from archival material. They did, however, note that behaviours exhibited at the crime scene are most likely influenced by situational factors (such as location, victim resistance and so on) and that future studies examining the homology assumption must consider the behaviours exhibited across a variety of different situations (such as outdoors).

Continuing the work of Mokros and Alison (2002), Woodhams and Toye (2007) examined the notion of homology within their sample of robbery offences (see above). They derived several offence behaviours from police records including the timing of offences, day/night, weekend/day), type of premise (for example, high street), whether the offender acted on his own or within a team, whether the offender(s) had their face covered, the type of weapon used (for example, firearm) and the offender's manner (for example, calm). The

offender characteristics included within the study included age, ethnicity, employment, previous convictions and distance travelled to home base.

The researchers found that offence behaviours fell into three clusters; offenders were either Violent opportunists (impulsive, risk takers), Organised risk takers (more professional, indicating higher levels of planning), or Bladed nocturnal planners (targeting premises that were low risk, with moderate levels of planning). Woodhams and Toye (2007) found no significant differences in the distances travelled or median ages between offenders within each behavioural style; nor did they find significant differences when performing chi-square analysis comparing associations between the styles and the nominal offender characteristics (for example, ethnicity, employment status). The researchers concluded, therefore, that evidence for homology had not been found.

Some studies considering the homology between individual offence behaviours and offender characteristics have also not been as 'successful' as the Davies et al., (1997) paper. Scott et al., (2006), for example, using similar methods to Davies et al., (1997), examined whether the behaviours exhibited in 99 stranger rapes in New Zealand were related to the offenders' previous convictions. Using logistic regression, they found that the accuracy of predicting convictions from behaviours was quite low.

A more recent study carried out by Doan and Snook (2009) found limited support for the homology assumption. The authors used a sample of 87 arson and 177 robbery offences recorded by the Royal Newfoundland Constabulary (RNC) in Canada and classified both types of offences into types, according to existing typologies. For the arson offences, Doan and Snook (2008) classified the arson offences into one of the four types found within Canter and Fritzon (1998) based on 39 behaviours exhibited within the offence. They examined whether these typologies were related to offender characteristics; namely, previous convictions, age, previous psychiatric treatment, whether the offender had a previous warning for criminal behaviour but had not been charged, history of theft, history of criminal damage, history of burglary, history of assault, and a history of not complying with a court or probation order or failing to appear in court. Doan and Snook (2008) found that, although there was a significant association between the type of arson offence overall and particular offender characteristics (for example, whether the offender had a previous conviction), there was little difference, in terms of frequencies, between the occurrences of the offender characteristics between some, particular typologies. For example, offenders within 16 of the Instrumental-Person type had a previous conviction, a figure similar to the Expressive-Person typology which had 21. Thus, this did not show strong support for the homology assumption.

To further test this, Doan and Snook (2008) collapsed the offence typologies to be either Expressive or Instrumental, and Person or Object. They found that there was a significant association between the type of arson (Expressive or Instrumental) and some background characteristics (for example, previous convictions, age, and psychiatric history) but not all (for example, past theft, criminal damage or assault history). Similarly, the authors found a significant association between arson type (Person or Object) with some, but not all, of the background characteristics.

In terms of the robbery offences, Doan and Snook (2008) considered 132 commercial robberies that had been solved and had been committed between 1978 and 2001. Again, the researchers coded for offence behaviours and classified the offences according to Alison, Rockett, Deprez, and Watts' (2001) robbery typology. This differentiated robbery offences into three types; Cowboys, Bandits and Robin's Men and considered how each could be related to 14 background characteristics (for example, previous arrest history and age). The authors carried out associations between the types and background characteristics and found some significant associations. However, in general, the authors concluded that they had found limited evidence to support the homology assumption.

From the findings of the studies outlined above, it seems that tests of the homology assumption produce inconsistent results. Goodwill et al., (2009, p.511) acknowledged that some models that sought to predict offender characteristics from offence behaviours were often derived by researchers from very different theoretical backgrounds and that particular models "have been applied to the practical application of offender profiling with little understanding of the comparative advantages and disadvantages of the disparate models." Additionally, the authors felt that there was a need to examine exactly which behavioural model or aspects of a behavioural model were particularly useful or accurate (if at all) at predicting particular offender characteristics. They argued that particular behaviours (or types of behaviours) may be more influenced by other factors, such as the situation within which they occurred. Therefore, Goodwill, et al., (2009) compared the predictive utility of three behavioural models; the MTC: R3 (Knight, 1999), Hazelwood and Warren's (1987) Power and Anger model as well as Canter et al.,'s (2003) behavioural model of stranger rape behaviour. They also used a 'multivariate' model, which consisted of individual behaviours.

Goodwill et al., (2009) examined the accounts of 85 rapes perpetrated by strangers within the UK between 1997 and 2002. Through the use of content analysis, they found 27 offence behaviours within the rapes and classified these behaviours into the various themes or typologies within the three models. Offender characteristics used within this study were five

types of pre-convictions (sexual, property, violent, drug and/or weapon, and other offences). Each offender was classified in terms of how they fitted each of the models; for the multi-variate model, all behaviours (present or absent) were used as a behavioural profile[1] for each offender. The authors adopted the methods used by Davies et al., (1997) in previous offender profiling research and various case linkage studies. Therefore, they examined how accurate the particular models were at predicting offender pre-convictions using logistic regression and then compared the predictive utility of these models against each other using Receiver Operator Characteristics analysis.

Goodwill et al., (2009) found, overall that the multivariate model (considering the presence or absence of all the behaviours that could occur), was most accurate at predicting pre-convictions. In particular, the behaviour 'anal penile' was particularly accurate at predicting whether the offender had a sexual conviction in his background. The authors found that if this behaviour was exhibited within the offence, the offender was 8.4 times more likely to have such a conviction. Similarly, they found that offenders who tore their victim's clothes were 17.6 times more likely to have a violent pre-conviction, those who used a weapon 4.6 times more likely, and those who had performed cunnilingus on their victims 96% less likely to have a previous conviction for violence. Weapon use was also accurate at predicting drugs or weapon pre-convictions; those who had used a weapon were 7.5 times more likely to have such an offence background than an offender who had not displayed this behaviour in the rape.

In terms of the other models of rape, the MTC: R3 did show some accuracy at prediction. In particular, those who displayed behaviours indicative of the Pervasive anger type were 6.7 times more likely to have a conviction for a sex offence than an offender who could be classified as Opportunistic. The Power-Anger model (Hazelwood, 1987) also showed a level of predictive accuracy. Notably, offenders who could be classified as Anger excitation rapists were 6.4 times more likely to have a previous conviction for a sex offence than those who could be classified as an Opportunistic offender.

The results of the ROC analysis showed that the multivariate model was the most accurate at predicting whether the offender had a conviction for a sex, property, violent or weapon and/or drugs offence. For the first three types of offences, the MTC (Knight, 1999) was the second most accurate predictor, whilst the Power and Anger was the third most accurate. For weapons and/or drugs pre-convictions, the Power and Anger model was the

[1] Not an offender profile

second most accurate predictor. Canter et al., (2003)'s model was not a significant predictor of any of the offenders' pre-convictions, using ROC analysis.

Goodwill et al., (2009, p.528) concluded that, due to the 'success' of the multivariate approach at predicting offender characteristics, "emphasis should be placed on further exploration at the individual level (e.g. bivariate relationships between crime scene elements and offender characteristics) to identify those behavioural elements within each typology, thematic representation, and multivariate approach that are most pragmatically useful." They go one to add that, "a simplified bivariate approach may help to identify which variables are more influenced or moderated by other situational or contextual elements of sexual offences." (Goodwill et al., 2009, p.528).

In summary, the research into the homology between offence behaviour and offender characteristics is varied. Some studies offer findings that support homology to some extent, whether it be by comparing thematic models of behaviour and characteristics (for example, Canter & Fritzon, 1998; Häkkänen et al., 2004), or by examining individual behaviours against the offender background variables (for example, Davies et al., 1997). Other studies have been less favourable, with limited evidence for the assumption, at both a thematic (for example, Mokros & Alison, 2002) and a bivariate level (for example, Scott et al., 2006). Researchers in this field have often explained and examined the reasons for this lack of consensus; Goodwill et al., (2009) have suggested that factors such as the context within which the behaviours have been exhibited are an important influence on any association between actions and characteristics. This and other factors that may affect consistency, inter-offender variation and homology are discussed in the following section.

1.10 Factors that may affect consistency, differentiation and homology

Researchers have postulated that consistency, differentiation and homology are thought to be influenced by two main factors[2]. The first is situational influence; researchers argue that contextual factors will have a considerable impact of the exhibition of various offence behaviours (for example, Alison et al., 2002). This has implications for both offender profiling and case linkage; as Alison et al., (2002) argue, the ability to predict offender characteristics from offence behaviours will be limited, unless the context of the situation is acknowledged. Referring back to the literature within personality psychology, internal systems (such as CAPS) are thought to be different for everyone; the cognitions and emotions

[2] For other factors which may influence consistency (such as timing and expertise, please see Woodhams et al., 2007 for a review)

that are activated, as well as the strength of the association between external and internal triggers are proposed to be highly individualised (Zayas, Shoda, & Ayduk, 2002, cited within Woodhams et al., 2007). Therefore, different situations or sets of circumstances will elicit a wide range of responses in different people. Referring to a rape situation, in a simple example, victim resistance may cause an offender to abandon his attempts; victim resistance for another offender may provoke a more violent response. Indeed, within a review of 10 years of studies examining various consequences of victim resistance, Ullman (2007) found that victim response can have an influence on offender behaviour; some studies suggest that victims who use physical resistance strategies (such as biting and scratching the offender) are less likely to be raped (NCVS; Clay-Warner, 2002, cited within Ullman, 2007), whilst other studies, such as Prentky, Burgess and Carter, 1986) have suggested that the amount of physical resistance a victim uses will make the offender more forceful and physical in his response (cited within Ullman, 2007).

In a similar vein, others have examined the types of behaviour within offences and have considered whether particular actions are more or less resistant to situational influences. In general, distinctions have often been made between actions that are exhibited without a specific trigger and act upon the environment to produce a consequence, or reinforcement (C/F operant behaviours, Skinner, 1966) and those which are brought about by a response to a particular cue (McClelland, 1984); others refer to these behaviours as *proactive* or *reactive* (Crick & Dodge, 1996), or those that are *emitted* and *elicited* (Funder & Colvin, 1991). Theorists have indicated that spontaneous 'emitted' behaviours are often more consistent than reactive 'elicited' behaviours (Funder & Colvin, 1991, cited from Woodhams et al., 2007). Indeed, studies described above which examine the consistency of behaviours in serial offences and the accuracy of these behaviours at predicting linkage, have found that behaviours that are less dependent on situational factors are more 'stable' over time. For example, Bennell and Canter (2002), Bennell and Jones (2005), Tonkin et al., (2008) and Markson et al., (2010) have all found that inter-crime proximity is an accurate predictor of case linkage; offenders are targeting properties (or victims) which are close together in space. As Bennell and Jones (2005, p.38) argue, "Of all the various decisions made by a serial burglar during the commission of his crimes, his choice of burglary locations is possibly the most crucial, being the one decision over which the burglar has considerable control." Therefore, before the offender has a chance to react to the situation around him, his 'emitted' behaviour remains consistent.

This may be an explanation as to why other behaviours within linked series are more consistent than others. For example, Woodhams and Toye (2007) found that behaviours that could be classified as 'Control' behaviours (such as the use of a weapon and whether the offender worked as a team or on their own) were more consistent than other behavioural domains (including inter-crime proximity) in a series of robbery offences. They postulated that such behaviour is less situationally dependent and more under the influence offender and thus, more resistant to change. Bennell and Canter (2002) argue that behavioural aspects of the crime (such as the type of target selected and property stolen) may more sensitive to situational influences and thus, less likely to be consistent and provide utility for linking crimes together. It could also be argued, therefore, that they are less useful from which to infer offender characteristics as their activation is less consistent. For example, as Bennell and Canter (2002) outline, property stolen in a burglary will depend on the type of property available at the crime scene. Thus, it would be difficult to make inferences about the type of offender who stole particular items, when the choice of items to steal was limited.

The second factor which may have an influence on the ability for link actions to characteristics and to link crimes together is the development and change of an offender throughout his offending 'career.' Davies et al., (1997) postulate how offenders may change their behaviour over the course of a series of crimes in response to their 'successes' and 'failures.' For example, if an offender tries to seek out victims to rape in a particular area but cannot find a 'suitable' victim, he may go elsewhere in the future. Likewise, if an offender attacks a victim who physically resists him and, thus causes the rape to be 'incomplete', the offender may use a weapon in his next offence to assist in his control and subjugation of another victim. Davies et al., (1997) make reference to a study carried out by Douglas and Munn (1992) who noted that serial homicide offenders will develop and change their behaviour as their series progressed. They also found that, if the offender had been incarcerated for a period of time, this had an impact on their offending behaviour. It could be hypothesised that the offenders are learning from others in prison or reflecting back on their previous crimes. Lundrigran and Canter (2001) also found that the spatial behaviour of serial homicide offenders changed over a period of time. Notably, offenders would learn that returning to an area within which they had previously offended may have higher risks for them; crime prevention strategies may be in force to prevent such a crime happening again and therefore, the offender may be at risk of apprehension.

1.11 Summary of offender profiling and case linkage research

As the above sections outline, the operational tasks of offender profiling and case linkage have been topics which have come under research-scrutiny over recent years. Different approaches to offender profiling have been developed that have produced varying levels of evidence for the ability to infer an offender's background characteristics from offence behaviours exhibited at the crime scene (for example, the Criminal Investigative Approach, Hazelwood, 1987; Clinical classification systems, MTC: R3, Knight, 1999; The Statistical Approach, Canter et al., 2003). Equally, several attempts have been made to systematically examine ways in which offences can be linked together based on behavioural information, rather than from forensic or other evidential means (for example, Bennell & Canter, 2002; Markson et al., 2010). Both offender profiling and case linkage are methods that rest on two assumptions; firstly, that offenders must display a certain amount of behavioural consistency (Canter, 1995) and, secondly, that this consistency must be different, in some respect, to the behaviour of other offenders (inter-offender variation, Goodwill & Alison, 2007). Offender profiling is also based on the premise of homology (Mokros & Alison, 2002); that offenders who exhibit the same kinds of offence behaviours will also share the same background characteristics. Evidence for behavioural consistency and inter-offender variation within various different types of offences (including sex offences) has been promising; with researchers finding that less situationally-dependent behaviours (such as the spatial behaviour of offenders) are more consistent than others (for example, Bennell & Canter, 2002), which may be more sensitive to contextual influence. Evidence for homology is less conclusive; some researchers have found that behavioural themes exhibited at the crime scene can be related to broad themes of offender characteristics (for example, Canter & Fritzon, 1998), whilst others have found that particular offence behaviours (such as forensic awareness) can be indicative of previous convictions (Davies et al., 1997). However, other studies have found that those who share similar overall offence behaviour are not similar demographically or in terms of their previous convictions (Mokros & Alison, 2002) or that they are unable to predict particular offender characteristics from specific offence behaviours (Scott et al., 2006).

Throughout this discussion, the importance of examining offenders' spatial behaviour has been emphasised. Findings from case linkage studies have highlighted the efficacy of using inter-crime proximity as a way of linking offences together; theoretical models that seek to explain behavioural consistency emphasise the value that behaviours under the control of the offender (such as spatial behaviour) will be more likely to remain stable over

time than other situationally-dependent behaviours. The next section will outline various theoretical models that seek to further explain why offenders' spatial behaviour is such an important factor to consider and how research, so far, has tried to examine the important interaction between geographical and behavioural elements of offences in a way that better describes the dynamic nature of crime.

1.12 The spatial behaviour of offenders

1.12.1 Theoretical background

Various ideas from environmental criminology theories help us to better understand the spatial behaviour of offenders. Developed by Cohen and Felson (1979), Routine Activity Theory proposes that offenders will come across opportunities to offend through their daily, routine activities. As part of this idea, Cohen and Felson (1979) emphasised the importance of crime converging in space and time and suggested that there must be three necessary components for crime to occur. These are a) the presence of a motivated offender b) a suitable target and c) the absence of a capable guardian. Thus, in a rape situation, there must be an offender motivated to rape; a suitable victim present and the absence of a capable guardian (for example, Closed Circuit Television, the Police, and witnesses). Van der Kemp and van Koppen (2007, p.353) note that "in this model, "opportunity" is an important concept to explain criminal behaviour." Felson (2002) explained that a suitable target is often thought of being valuable or desirable to the offender, a target that is visible, one that is easy to access and to escape from, and one that is inert. These aspects can be applied to both the targets of property crime (for example, a house to burgle) and a crime against a person (for example, a victim to rape). This theory seems to suggest that offenders' spatial behaviour is affected by offenders' and victims' routine activity, the availability of a suitable target, and the 'right kind' of physical environment.

The second related theory used to understand the spatial behaviour of offenders is Rational Choice Theory (Cornish & Clarke, 1986). This emphasises the importance of offender's decision making within crimes, and underlines that, even in the most expressive, violent crimes, offenders seem to act in a rational, problem-solving manner. Thus, before action occurs, offenders will weigh up the potential costs (for example, the risk of apprehension) and the benefits (for example, sexual gratification or monetary gain) of committing the crime. In relation to the environment, it is proposed that the decisions made throughout the commission of crimes are governed by cues emitted by the environment.

Rational Choice Theory would state that even the most violent or sexual crimes would come about due to rational decision making. As Beauregard, Proulx and Rossmo (2005) state, in a date-rape situation, for example, the offender might not have planned to rape but chooses to do so when the victim does not issue consent.

Drawing on the ideas presented in Routine Activity and Rational Choice Theory, Brantingham and Brantingham (1981) developed Crime Pattern Theory. They proposed that crimes are not randomly distributed due to the environmental 'backcloth', against which they occur, the opportunities that occur alongside them, and the routine activities of offenders. Brantingham and Brantingham (1981) claim that offenders will have an internal 'awareness space' (similar to the notion of a 'mental map') which will have been developed from their daily activities and that offenders will use this awareness space to seek particular targets, offending in specific places. For many years, cognitive theorists and urban planners had been exploring the idea that all humans hold internal representations or schemas to help them understand their environment (Bartlett, 1932, Lynch, 1960). Mental maps do not look like 'real' maps in the strict sense, but rather, would be distorted by experience. As individuals become more familiar with novel surroundings, mental maps change and become more complex.

Awareness spaces include nodes (the places that people travel to and from, e.g. home, work or friend's house), paths (the routes between the nodes) and edges (the boundaries of the region of familiarity). Brantingham and Brantingham (1981) speculated that offenders choose their targets according to these established schema – for example, a burglar may choose a particular property to steal from based on previous knowledge of property in their own neighbourhood, choosing to target types of houses that they are familiar with. Similarly, offenders may only choose houses to burgle which are based along routes which they regularly pass.

The Brantinghams' useful hypotheses were followed up by empirical studies testing the idea of 'Criminal Cartography.' Researchers began to ask offenders to sketch maps of their offending space and found that these could provide interesting insights into the way in which they perceive their local environment, perceive the routes to crime and select targets (for example, Canter & Hodge, 2000).

Although such a method can help us to come some way in understanding offenders' thought processes, sketch maps only give a rough approximation of the psychological processes involved in their decision-making. There are other obvious limitations with this method, such as the reliance on the ability of the artist to draw well and to understand fully

the instructions set out by the researcher (Canter & Hodge, 2000). Examining criminal cartography may well be a good starting point to explore such issues and would perhaps need to be followed up by interviews with the offenders to gain more background information (Canter & Hodge, 2000).

Similar to Rational Choice Theory, the Brantingham's suggest that offenders will weigh up the costs and benefits of committing crimes when the opportunity arises. Contrary to Rational Choice Theory, Crime Pattern Theory suggest that this decision-making may not be a purely rational process and that the environment might 'leak' cues prompting the offender to offend, rather than the offender actively seeking out opportunities to offend. All three theories above begin to explain the reasons for the patterning and distribution of crime. They also start to help to understand how offenders travel to and make decisions about where, when and how they offend.

Several researchers have commented on the significant influence that the offender's home base may have on spatial behaviour (for example, Canter &Gregory, 1994). This notion of 'domocentricity' implies that offenders use their home base as a central, focal point when travelling out to commit crimes. This is supported by works such as Amir (1971) and LeBeau (1987a) who have found that rapists often operate from a fixed home base, quite central in space to that of their offences. Therefore, offenders seem to be travelling from their home base to commit crimes, often along routes and pathways that they frequent in their routine activities (Rengert & Wasilchick, 1985).

In summary, these three theories may help us to better understand why offenders may behave consistently in terms of their spatial behaviour. Offenders will often commit offences within areas which are familiar to them and they will be guided by some level of decision-making. In essence, the offenders will be more likely to offend in less 'risky' situations. Previous research into the spatial behaviour of offenders has concentrated upon examining distances travelled to crime and the relationships such distances have with offender background characteristics or offence behaviours.

1.12.2 Journey to crime research

The majority of research examining sex offenders' spatial behaviour centres around examining the relationship between the location of the offenders' base or measuring the distances between home location and crime location (also called 'journey to crime' research). For example, Amir (1971) found that in 82% of solved rapes, the offender and victim lived in the same neighbourhood. Other empirical studies generally find that rapists, like other

offenders, do not travel very far to commit crimes. Cross-national studies have produced consistent findings; Canter and Larkin (1993) found that a sample of serial rapists within the UK travelled an average of 1.53 miles to commit their crimes; whilst in the USA, serial and non-serial sex offenders have been recorded as travelling mean distances of between 1.15 miles (Rhodes & Conly, 1981) and 3.5 miles (LeBeau, 1987a). In comparison to offenders who commit property offences, rapists, on average, do seem to travel shorter distances (Rhodes & Conly, 1981).

Aspects of the offender and the offence have all been shown to be related to journey to crime distances in both sexual and other crime types. In terms of offender characteristics, younger offenders have been found to travel shorter distances and be less mobile than older offenders (for example, Baldwin & Bottoms, 1976; Gabor & Gottheil, 1984; Canter & Gregory, 1994; Rhodes & Conly, 1991; Davies & Dale, 1995) and those with a past conviction have been found to travel further than those without a criminal record (Baldwin & Bottoms, 1976; Gabor & Gottheil, 1984; Rhodes & Conly, 1981). Equally, female offenders have been shown to travel shorter distances to offend than males (Rengert, 1975).

Perception of risk may also have an impact on distance travelled to crime. A phenomenon known as the 'buffer zone" is thought to exist around the offender's home locations (Turner, 1969; Brantingham & Brantingham, 1981). This is an area within which the offender will not offend for fear of possible recognition, such risks outweighing the 'benefit' of offending. In practice, this means that although distances to crime may be short, fewer offences will occur in close proximity to the offenders' home (for example, van Koppen & Jansen, 1998). However, other researchers have not found evidence for the presence of buffer zones (Lundrigan & Canter, 2000). Similarly, researchers examining homicide offences have found that offenders will often not go back to areas of previous offences to offend for fear of capture (Lundrigan & Canter, 2000). Increased police activity and public awareness may increase the risks for offenders and, therefore, they may travel to another location, perhaps further afield, to commit offences.

Little attention has been given to the distance travelled to where the offender initially locates the victim, although some researchers have pointed out the importance of obtaining this information (for example, Ruperal, 2004).

1.12.3 Examinations of spatial behaviour within crimes

A shift in focus has occurred within recent years; researchers have begun to examine how spatial behaviour seen within offences interacts with offence behaviour. This is partly

due to the call for a more detailed examination of the impact context (such as the location of the offence) has on the exhibition of behaviours within crimes (Mokros & Alison, 2002). Such models will not only help better detail offence styles of offenders (thus, developing theory) but may also help to 'improve' processes such as offender profiling and case linkage. A recently developed model highlights the dynamic nature of the rape event, and how geographic and offence behaviours may interact (Beauregard, Proulx, Rossmo, & Leclerc, 2007).

This model (discussed in full in Chapter Four) uses interview data from incarcerated serial sex offenders to examine the rational choices offenders used when hunting for, selecting, approaching, moving and raping their victims. The model provides an insight into the decision-making strategies and cost-benefit analysis serial sex offender make when carrying out their offences. Such information may be beneficial for crime prevention strategies, clinical rehabilitative work for offenders and risk assessment. This work extended and set the framework for the valuable interview studies carried out by Beauregard and colleagues in their various decision-making studies (Beauregard et al., 2007a; Beauregard & Leclerc, 2007).

However, it is argued that this model is limited in its application to the investigation of rapes perpetrated by an unknown offender, it uses analysis techniques that may not fully explore the qualitative inter-relationships between geographical and behavioural variables and it is based on a model (Rossmo, 1997) that has not been empirically tested (van der Kemp & van Koppen, 2001).

1.13 Rationale and research questions

The thesis aims to examine the spatial behaviour of stranger rape offenders *within* their offences and to examine how this relates to their offence behaviour. This has been carried out to meet the call for a better understanding of how situation can influence the exhibition of offence behaviours (Mokros & Alison, 2002). This thesis emphasises the importance of using spatial behaviour as it has been shown to be consistent across serial offences, and can help to predict case linkage. Moreover, such behaviour is seen to be more within the 'control' of the offender (Bennell & Jones, 2005). The utility of using such spatial behaviour to predict offender characteristics will be explored as well as how useful it is to link serial stranger rape offences together. The specific aims of the thesis are to:

- Examine the nature of detected stranger rape within the Metropolitan Police Service between 2004 and 2006, paying particular attention to the background characteristics of both victims and offenders
- Explore the spatial mobility of offenders within their crimes and to develop a model based on this geo-mobility
- Examine the behavioural themes exhibited within the offences
- Consider how the geo-mobility styles relate to these behavioural themes
- Examine whether geo-mobility styles are more accurate at predicting offender characteristics than individual spatial and offence behaviours
- Assess whether geo-mobility styles are consistent and yield inter-offender variation across linked pairs of stranger rapes
- Consider whether the geo-mobility styles are more accurate than individual spatial and offence behaviours at predicting case linkage.
- Consider whether inter-initial approach proximity is a more accurate predictor of case linkage than inter-crime proximity.

CHAPTER TWO
METHODOLOGY

This chapter will examine the sample used within the thesis, the data collection process, the variables and measures used, and the design and analytical methods used in each chapter.

2.1 Sample

The main sample of data used within this thesis is of 112 stranger rape offences, recorded by the Metropolitan Police Service from May 2004 to December 2006. These offences were committed by 131 offenders against 114 victims.

2.1.1 Source

The source of the data used within the thesis is The Metropolitan Police Services' Crime Report Information System (herein referred to as CRIS). This is the database used to record details of all reported offences in the MPS's 32 policing boroughs, covering an area of 1578 km². The population policed by the MPS is 7.2 million, and hence, it is the largest police force in the UK (MPS, 2009).

Each borough has its own CRIS database. Each recorded offence is given a Crime Reference Number and has its own crime report. These CRIS reports were used as the basis for the present sample. The offence reporting process for a rape is as follows. A crime is reported, either by a victim or a third party. Officers input information pertaining to the crime onto the computerised CRIS system. Some information is recorded in a coded format; other information is recorded in free text. Information recorded on CRIS, although always inputted by a police officer, can come from various different sources. These are:

1. Victim statements (initial contact with police officer, initial interview with Sexual Offence Investigation Techniques Trained officer (SOIT), transcripts from the Achieving Best Evidence (ABE) interview (a video-taped interview)
2. Suspect interviews
3. Witness interviews
4. Detailed description of the direction of the investigation (including any evidence given and decisions made
5. Medical assessments from the Forensic Medical Examiner (FME)

Appendix Three shows an example of a fictitious but 'typical' CRIS report. At the beginning of the report, there is a brief summary of the offence location, times, dates, victim characteristics, any *suspect* information and any *accused* information (a suspect will become an accused when they are arrested for the offence). After this, all the notes from the investigation are shown, typically with content as explained above (1-5). At the end of the report, a summary of the allegation and the closing status of the crime are given (that is, whether the crime was *detected* or *undetected*. A crime becomes detected when a suspect is arrested, so, when they become an accused).

2.1.2 Limitations of using CRIS as a data source

Using police data to investigate psychological mechanisms has long been considered a problematic task (see Alison, Snook & Stein, 2001 for a full review). Thus any conclusions as to the spatial and offence behaviour of offenders as a result of considering CRIS must be made with caution. The limitations of this data source are outlined below.

2.1.2.1 Consistency

The consistency of the information recorded within CRIS may vary. Some elements of CRIS are inputted in a pre-determined format. That is, police officers will input information using 'drop-down' menus of codes, for certain fields. However, the main source of information within the reports that were used for this project was the 'free text' information. Within this, officers could write their notes from interviews (in this case from the victims of the attacks) and this is subject to variation. Variations in how much information the officer chooses to write on the CRIS could limit the information given. In some cases, the ABE interview is transcribed; in others, there are just notes to say that the ABE was carried out. Also, as CRIS is subject to disclosure in court, investigators may also limit information or observations that are relevant on the reports made. Variations in results between different officers therefore, or different Sapphire teams may reflect different protocol (Alison, et al., 2001). Indeed, the size of the reports do vary in terms of the quality and quantity of information available to police officers and could be put down to the experience or recording practice of a particular officer or borough.

Out of the 112 CRIS reports used within the main sample for this study, there was one victim account of the rape in 16 cases (14.3%), two accounts in 41 cases (36.6%), three accounts in 34 cases (30.4%), four accounts in 13 cases (11.6%) and five accounts in eight

cases (7.1%). The mean number of accounts is 2.61 (*SD* = 1.09), with a median of 2.00. Therefore, there is variation in the number of accounts available for examination but as nearly 85% of the statements have at least two accounts and nearly a third have three, there is scope for a detailed analysis of the victims' statements. Also, the ABE interview has been transcribed and included within the CRIS reports in 67 offences (59.8%). These are the victims' accounts verbatim and therefore, give a detailed account of their experience.

2.1.2.2 Validity

The validity of using CRIS reports may also be called into question. The present study uses the descriptions from victims of the spatial and offence behaviours used within the attacks, which have been transcribed and interpreted by police officers. Thus, variables within the coding dictionaries (see below), may not measure what they are intended to measure. An example would be the use of the variable *strangle*. One officer may record that the offender has 'held the victim by the throat.' Another officer may record this as the offender 'strangling' the victim. The severity of the same action could be interpreted through the use of the language. In the former case, the action could be interpreted as the offender restraining the victim in order to control their movements; the latter case implies that the offender was using excessive force with intent to harm her. Of course, this language may correctly convey the true behaviour that occurred. However, depending on how the victim interpreted the action, and subsequently, how the officer recorded that action could have implications for the validity of the coding dictionary. The inter-rater reliability testing and subsequent iterations of variables helped to clarify ambiguous meaning.

2.1.2.3 Generalisability

The representativeness or generalisability of the findings of using recorded crime data is limited. As many rapes go unreported to the police, (Walby & Allen, 2004) the present sample may be unrepresentative of all stranger rapes. However, as stranger rapes are more likely to be reported than acquaintance rapes (Rabkin, 1976), any conclusions formed may be more representative than if other types of more intimate assaults were to be considered.

2.1.2.4 Biases of victim recall

Deriving information about the behaviour of the offender from victim statements may have inherent biases. The difficulties in eye witness testimony as evidence is well recorded (see Wells & Olsen, 2003) and rape victims may be particularly susceptible to this. The

traumatic nature of the event itself may distort the victims' view of events; much research has provided an indication that many rape victims may suffer from a form of post-traumatic stress syndrome, Rape Trauma Syndrome (Burgess & Holmstrom, 1974). Symptoms of this can occur during, immediately after and for long periods after victims have been raped and often include dulled memory functions (Burgess & Holmstrom, 1974; Holmstrom & Burgess; 1975). Therefore, a note of caution has to be given when using information derived from the victims' statements. However, as the victims are asked to recount the attack up to three times, victims often recall forgotten memories and clarify information.

2.1.2.5 Practicality

The practicality of using CRIS data to examine the spatial and behavioural elements of stranger attack may also be difficult. As Alison et al., (2001) point out police data is not collected for use in psychological study. Thus, certain variables that may have particular psychological relevance may not be given. For example, certain background characteristics of the offenders, such as psychiatric or family background are not collected within these reports. Data is collected for evidential purposes and is limited by time and resources. However, in the same vein, because the victims' statements are subject to disclosure in court, the behavioural information within these was found to be very rich.

2.1.2.6 Triangulation

Another limitation of using CRIS for this thesis is that it is the only data source used. Triangulating methods to gain crime data may have limited the biases inherent in using only police data (Denzin, 1978). Therefore, it would have been useful to gather information from other, perhaps non-archival sources. Other methods such as offender and police interviews may have been useful.

Although the present author recognises the limitations of using CRIS as a data source, it is also recognised that such a source has its benefits. Indeed, the non-obtrusive nature of using police data does not have the same constraints as traditional experimental techniques and thus, is not subject to issues such as experimenter bias (Alison et al., 2001). Also, in practical terms, the offence behaviour of rapists cannot be observed in any artificial situations. Using such archival methods to examine crime "is not simply an alternative or a supplement to conventional techniques, but rather is often borne out of necessity" (Alison et al., 2001, p.247). Thus, although the present thesis relies on one, archival data source, and, therefore, the biases of this are acknowledged, the feasibility of using other measures to study

such a phenomenon as rape is limited.

2.2 Data collection

2.2.1 Access to data

This project was part-funded by the MPS as part of a CASE award, collaboration between the University of Liverpool, the Economic and Social Research Council (ESRC) and the MPS. Therefore, permission was granted to have access to the relevant police data for use on this project. The present researcher was subject to and security cleared according the Metropolitan Police's security protocol. The data collection process was fully supervised.

2.2.2 Training with MPS in their Crime Management Procedure

Training was given by the MPS' Intelligence Bureau Serious Sexual Offences desk with the help of Special Projects Desk of the Violent Crime Directorate and 'Project Sapphire.' The main focus of this training was to establish how CRIS fits in with other MPS databases as well as how to look up information and extract the crime reports from CRIS.

As stated previously, CRIS is a database that contains all crime reports in the Metropolitan Police Services' area. Once a crime is reported, it is assigned a Crime Reference Number and officers can input information on to it. The author of this thesis was shown how to input information on to CRIS, in the same manner that an officer would. The officer has to explain all details of the crime, using either 'drop down' menu, or by typing in the narrative of the incident, often as it unravels. Once the crime is recorded onto CRIS, the report acts as a running record that can be updated until the crime is either 'Detected' (an offender is arrested), 'Undetected' (the crime is on-going, or an offender cannot be arrested), 'Transferred' (the crime has actually been committed outside of the MPS area) or given the status of 'No crime' (the situation has been reviewed and it is decided that a crime was not committed, the offence is proven to be a fabrication or if the offence has been reported to a Sexual Assault Referral Centre but the victim does not want to report the case to the police).

2.2.3 Data selection process

The first step in collecting the data required for this thesis was to negotiate the type of crimes that would be appropriate. The original proposal submitted and accepted by both the MPS and the ESRC was for the researcher to investigate (primarily) the geographical locations of 2 years worth of serial stranger rapes and consider these alongside the

geographical locations of the respective offender home bases. Therefore, such crimes would have to be 'detected' and the sample size would have to be feasible enough for a PhD study. The researcher decided to consider a year's worth of Stranger Rape offences recorded in 2005 to consider the feasibility of this task. On doing so and with discussion with police officers, it was discovered that this task would not be as straight forward as previously thought. Firstly, serial stranger rape is not frequent (or frequently reported); secondly, the detection rate in rape cases is often low[3]; thirdly, there was some contention as the meaning of the term 'stranger.'

The challenge to identify serial stranger rape offenders (more than one stranger rape offence committed by the same offender) was centred on identifying repeat offenders within the 806 cases. Offenders (either suspects or accused) are not given a unique identification number; details given about the offender include their names, their dates of birth, and if they have one, a PNC[4] number. Potentially, therefore, to establish whether one offender is recorded more than once on CRIS, it is necessary to match up these details to be sure of linking the offences together. Sometimes, this task is relatively straightforward; in some cases, if names are misspelt, the offender decides to give false details or if information is recorded inaccurately, this process might be more difficult. Therefore, within initial examination of the data, repeat offenders were discovered by but trying to match them firstly by name, then by any PNC numbers and then by dates of birth. Within the 806 cases, 273 offenders were identified (in detected cases). Of these 273, 263 were 'unique' offenders; 255 were recorded as having committed one offence each; eight offenders committed more than one offence. Therefore, potentially, there were eight serial stranger offenders recorded per year. Not only is this a low sample size, there were other issues that may further limit their use in the present thesis (such as whether these offenders had really committed 'stranger'

[3] Walby and Allen (2002) estimate that only 15% of rapes are reported to the police. The decision by the victim not to report the rape is thought to be associated with a number of factors, including fears about the investigation and trial process, the traumatic nature of having to relive the rape again, feelings of shame, embarrassment, guilt or fear of retribution. If the crime is reported, there are often problems with being able to apprehend an offender or the victim may decide to withdraw their complaint (Kelly, Lovett, & Regan, 2005).

[4] A PNC number is given to any person that has been convicted of any offence within England or Wales. PNC stands for Police National Computer and is a networked computer system and database that can be fully accessed by all territorial police forces in the UK as well as other law enforcement agencies. The PNC holds sets of information including, amongst a wealth of other information, the details of people that have been convicted, cautioned and arrested for crimes within the UK. Impending prosecutions, disposal history (sentence given when found guilty in court), and details of wanted or missing people are also detailed on the PNC. This system can be fully accessed by all territorial police forces in the UK as well as certain other law enforcement agencies. Partial access is given to agencies such as the Criminal Records Bureau. The PNC is also linked up to outside organisations such as the Driver and Vehicle Licence Agency (DVLA) and the Motor Insurance Database (MID), as well as providing links to fingerprint and DNA databases.

offences). These will be discussed presently.

The second issue that affected the data collection was that of the detection rate of stranger rapes. As previously mentioned, the detection rate of any rape is relatively low. Indeed, out of the 806 stranger rape offences recorded in 2005, 27.7% of cases were detected at the point of data collection (which was carried out in 2007). Potentially, therefore, 223 cases could have been considered for inclusion in this study; however, there was some deliberation about whether all cases were suitable for the present thesis. This was mainly due to the observation that many reported rapes had not been committed by 'complete' strangers.

Originally, the researcher had had pre-conceived ideas about the term 'stranger' and had assumed that this meant that the offender would be attacking a victim with whom the offender had no prior relationship. After considering the data available, it was discovered that 'no prior relationship' did not necessarily mean that the victim and the offender had not spent any time together before the attack. Indeed, the victim would often report that she had been attacked by a stranger but, upon further investigation, she had spent time with him at his flat before the attack or had other previous knowledge of him. These types of rapes pose different investigative challenges for the police (primarily concerning issues of consent rather than establishing the identity of the offender). As the main aims and questions of the present thesis are concerned with the spatial and offence behaviour of offenders who chose to attack victims without building any kind of relationship with them and the implications of trying to locate such an offender, it was necessary to ensure that these kinds of cases were selected for inclusion. The Metropolitan Police Service classifies 'stranger' rapes in two ways. 'Stranger 1' rapes are those where there has been no prior contact with the victim or where there are brief comments/questions between victim and suspect. 'Stranger 2' rapes are those where the victim and suspect are briefly known to one another, for no more than 24 hours. Stranger 2 offences were also those which involved the rapes of prostitute victims by their 'clients' and illegal mini-cab drivers. Even though these cases involved offenders who had no prior contact with the victim, they were classified as Stranger 2 because there was an element of trust established (and therefore a 'relationship') before the attack occurred, even though the offender would still have to be identified.

In theory, the decision was made to include just Stranger 1 type offences within the present thesis. Although attacks on prostitutes by clients and other such cases could be thought of as 'no prior contact', it was decided that these cases were not going to be used in this research. The examination of the geographical and offence behaviour within these offences is, obviously, of value, it was thought that these issues were outside the remit of the

study.

By reading through the 806 cases, it was found that not all rapes had been classified consistently, and that there were a great deal of Stranger 1 offences that had actually involved acquaintances, family and intimate partners of the offender and Stranger 2 offences that involved attacks where there was no prior contact before the offence. All of these cases were then independently assessed as to whether there was minimal or no prior contact between victim and offender before the offence. This is the definition used within Home Office studies (Feist, Ashe, Lawrence, McPhee, & Wilson, 2007). Having used this coding framework, it was found that within the 223 detected cases, 54 cases involved the victim and offender having no prior contact at all before the attack. Some authors consider this to be minimal or no prior contact between the victim and the offender before the offence (such as Feist et al., 2007); others regard this to include victims and offenders who met for the first time within the 24 hours (for example, McLean & Balding, 2003). There has been some criticism towards the varying definitions of what constitutes a stranger, considering that, "many essential relationship characteristics are not systematically or consistently collected" (Loftin, Kindley, Norris, & Wiersema, 1987).

Of these 54 cases, a further nine had to be excluded from analysis for a number of reasons. These included if the victim was male, the offence had been reported in 2005 but had not been committed in that year[5], the victim had not provided a firsthand account of the crime, if the victim was younger than 13[6], or the rape was part of repeat victimisation or stalking of the victim. This left 43 offences that could be used in the present study. As this was a relatively small number, it was decided that more data should be collected. Thus, this process was repeated for rapes within 2004[7] and 2006. These years were decided on for two main reasons. Firstly, the case was close enough to the date of collection to provide a picture of recent rapes; secondly, any trial which had come about by the investigation of the case would be likely to have been completed. Thus the outcome of any such trial would not be compromised.

Figure 2.2.3 shows how the stranger rape cases were selected.

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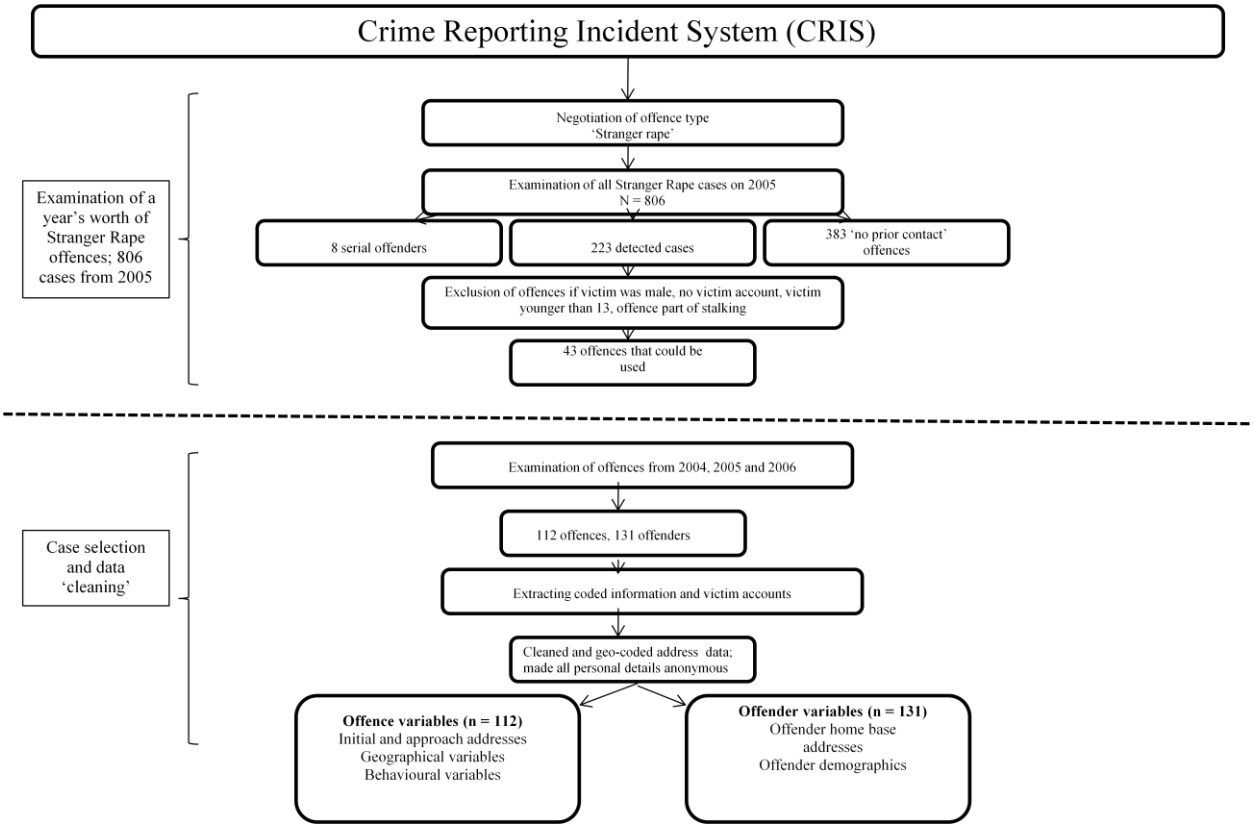
[5] This was usually because the victim had delayed reporting the crime or the case was being reinvestigated by officers working within Project Sapphire as 'Cold Cases'.

[6] The Sexual Offences Act (2003) distinguishes between offences against victim that at are either 13 or older, and those who are younger than 13.

[7] As the Sexual Offences Act (2003) came into force on 1st May 2004, offences recorded after this date were considered. This was due to a number of offences being reclassified as rape, which may not have been before. For further information, please see the Sexual Offences Act (2004).

Figure 2.2.3 Data selection and cleaning process



2.2.4 Data extraction and cleaning

After the case selection process was carried out again for 2004 and 2006, 112 offences were decided upon for inclusion within the present thesis (27 offences from 2004, 43 cases from 2005 and 42 cases from 2006). After this, the process of 'cleaning' the data could begin. The main details needed from the CRIS reports could be derived from various coded information throughout the reports and the victims' statements. The former included information on the offence (time, address), offender (age, ethnicity), and victim characteristics (age, ethnicity). The latter were recorded in a free text format throughout the reports. The coded information was transferred on to a spreadsheet, whilst the victims' accounts were copied and pasted onto Word documents. Before coding of offence information could commence, the statements had to be made anonymous; all identifiable information was replaced by generic terms. For example, the victim was called VICTIM, the offender SUSPECT, friends FRIEND 1, and 2 and so on.

After copying both the coded information and the victim accounts from each offence, there was other information that had to be derived from the CRIS reports. Some information, such as the offence location or the location where the victim was initially approached by the

offender, was not always readily available in a standard format and had to be derived from other information from the CRIS report. For example, if the victim could not remember where they had been attacked, the police would often drive around to try to establish the location. Also, in some cases, locations were described by the victim but the addresses were not known. The researcher, therefore, had to access Google Streetview © to try to establish the point of contact.

The two main aspects that the present thesis is concerned with are the geographical and behavioural elements of the stranger rapes. The behavioural coding will be explained later within this chapter; however, it is necessary to outline the process by which address data was 'cleaned' and the issues that arose out of this process.

Address data refers to the any street or location names that were assigned to the offenders' home bases, the initial approach location and the crime location. Please note that there were four types of location used within the thesis. There were; the initial approach location (where the offender and victim first encountered each other), the attack location (where the offender overpowered or threatened to overpower the victim), the crime location (where the offender raped or attempted to rape the victim) and the victim release location (where the offender released the victim). It was only possible to derive address data for the initial approach location and the crime location. Firstly, the accuracy of these addresses had to be verified. Most of the offender location and some of the crime locations had been given precise addresses. However, there were often problems with the accuracy of locations when the offence or approach had occurred in an open space (for example a park or common) or on a footpath or outside a certain location. Sometimes offences were described as being 'near to' or 'outside' particular locations. In the latter cases, these terms were removed and the locations that they were 'near' or 'outside' were used as the main address of the offence or approach. Although this may not be the precise location that the offence had occurred, it was thought that this was the most accurate that could be achieved. When offences were described as being within an open space or a pathway, the website www.streetmap.co.uk was used to determine the precise location. If locations were not given a precise enough address in terms of a house number, then the middle of the particular road or street was used as the offence or approach address (a method used within previous research, such as Lundrigran & Czarnomski, 2006). As stated previously, often the initial approach address was not specified in the CRIS report. Therefore, using the description from the victim, with the help of Streetmap.co.uk © and Google Earth ©, the precise location could be ascertained. Sometimes, the victim would be approached by the offender on a bus; in these cases, the

point where either the victim or the offender boarded the bus was used as the initial approach location. Bus timetables and route maps were used to pinpoint these locations. The extent of this issue within the Stranger rape sample (N = 112) is raised in Chapter Four.

In some cases, the victim was unable to recall where the offence happened; either because of the trauma of the attack but also because some were under the influence of alcohol and/or drugs. In these instances, the CRIS report was examined for any witness accounts of the attack or notes taken by the Scenes of Crimes Officers. Although this evidence did not come from the victim directly, it was thought to be useful.

In terms of offender home bases, most of the addresses (when given) were full and accurate. However, there were some issues surrounding the address given when the offender was in custody at the time of arrest. For example, if the offender was living in a different location when they were arrested which was not the same address that they were living in when they committed the offence, this was not known. Also, if the offender was in prison when they were arrested for the stranger rape, the offenders' home base would have been recorded as their prison address (for example, HMP Wandsworth). The most common issue when trying to locate where an offender was living was that some offenders are often of 'No Fixed Abode' (NFA) and they lead a transient lifestyle. There was no way of overcoming the former or latter issue. However, if the address given was a police station or prison, the CRIS report was looked over to try to establish the offenders' real home address. This was often found within the officers' notes; they would report the offenders' address at the time of the attack. Chapters Three and Four explain the extent to which these problems were noted in the sample used within the majority of this study (the *Stranger rape sample*) and the spatial measurements derived from the their past offences.

Once address data had been verified and cleaned, each address was geo-coded. This is the process of assigning co-ordinates to the address data, so that the locations could be placed on a map. This process is necessary to measure distances between locations. This process was carried out by locating a postcode for each address by looking these up on a Postal Address File (PAF) available from the software package Quick Address (QAS). After these were ascertained, the geo-codes for each postcode were found using a reference database (or 'gazetteer') from the website www.streetmap.co.uk. Geo-codes are given in metric Cartesian form and represent a projection derived from the British National Grid. All coordinates are measured in Eastings and Northings from a point (0, 0) somewhere in the sea to the south-west of the UK (Chainey & Ratcliffe, 2005).

The whole data screening and cleaning process was lengthy. However, after this

process, the Stranger Rape sample was derived and consisted of 112 offences, committed by 131 offenders.

2.2.5 Offence history

CRIS was then searched to find previous offences (where the offender had been arrested and charged for an offence) committed by each of these offenders.

Previous offences were found by using the offender's name as a search parameter and then by scrolling through a list of people, with the same name, who appeared on CRIS. The offenders were matched if their date of birth and any address or PNC information was the same. Sometimes, this process was lengthy, (if the offender had a common name), other times, they were easier to locate. For the offenders' past behaviour, all offences leading up to the stranger rape were selected. Each time the offenders had committed an offence before, the CRIS report was opened and copied and subjected to the same process as the stranger rape reports; the coded information for the offence was copied on to a separate database, then victims' reports were extracted. All identifiable information, from victims and offenders were then made anonymous; each offender was given a number from which to identify them in the future. For past offences, behavioural information was not coded, as this was difficult to compare between different types of crimes. The main information obtained from these crime reports were the offence committed, offender demographics, offender addresses and offence addresses. Out of the 131 offenders from the main sample, 104 had previous offences on CRIS. Between these offenders, they had committed 899 offences.

2.2.6 Serial stranger rape sub-sample

The second sub-sample of data used within the present study was that of serial stranger rape offences. All offenders' CRIS records were searched for previous rapes against strangers. As the occurrence of such series is relatively infrequent, offences committed after the main stranger rape were also used. The data extraction process was the same for this sample as with the others; information recorded from this included offender demographics, offence behaviours, offenders' addresses and initial and crime location addresses. The data cleaning and geo-coding process was the same. Therefore, this data set consisted of 17 series, committed by 17 offenders, who had committed a total of 46 stranger rape offences.

In summary, therefore, the main data set used in the present thesis consisted of 112 offences committed by 131 offenders. There were two subsequent sub-samples identified; firstly, the Offence history sub-sample which consisted of 104 offenders who had committed

899 offences between them and secondly, the Serial stranger rape sub-sample consisting of 46 offences committed by 17 offenders.

2.3 Variables and measures

2.3.1 General offence variables

Three variables were used to measure general details of the offence. These are shown in Appendix Four. These are *Month of the year*, *Day of the week* and *Time of day*. All three of these variables were measured categorically. See Appendix Four for further details of these categories. These variables were derived from the fixed format fields of the CRIS reports.

2.3.2 Victim background variables

Two variables were used to measure details of the victims' backgrounds. These are shown in Appendix Five. These are *Victim age* (continuous, measured in years) and *Victim ethnicity* (categorical). See Appendix Five for further details of these categories. These variables were derived from the fixed format fields of the CRIS reports.

2.3.3 Offender background variables

Appendix Six shows the offender background variables used. These refer to the *Offender age* of the offender at the time of the offence (continuous, measured in years), *Offender ethnicity* (categorical), *Distance to Initial approach location* (continuous, measured in kilometres), *Distance to Crime location* (continuous, measured in kilometres), *Offence history* (type of offence, categorical), (median) *Distance to previous offences* (continuous, measured in kilometres), (mean) *Mean-inter point distance between previous offences* (continuous, measured in kilometres). The *Offender age* and *Offender ethnicity* variables were derived from the fixed format fields of the CRIS reports. The *Distance to Initial approach location* and *Distance travelled to Crime location* were derived by retrieving the addresses for a) the offender's home base, b) the Initial approach location and c) the Crime location, obtaining the geo-codes for each of these addresses (x and y map co-ordinates) and calculating the Euclidian ('crow-flies') distances between any two given points using Pythagoras' theorem. For the *Distance to previous offences*, the distance for each crime each offender had committed in the past was calculated. For each offender, the median distance for each was used to measure how far the distance had been to a previous offence. The median distance was used as the overall sample was non-normally distributed (calculated using a Kolmogorov–Smirnov test, $Z = 6.13$, $p < .0001$). For the *Mean inter-point distance between*

previous offences, the distance between all pairs of all offenders' previous offences was calculated and the mean inter-point distance was calculated (this is a measure of dispersal often used in spatial mobility research; the larger the distance, the more spread out offences are. See Goodwill & Alison, 2005 for an example). The mean inter-point distances was used to measure dispersal because the overall sample was normally distributed (calculated using a Kolmogorov–Smirnov test, $Z = 1.21$, $p = .11$).

The *Offence history* variables were derived from searching for each of the offenders' offence history on CRIS (process outline below), noting the offence for which the offender was charged (from the fixed format fields of the CRIS reports) and recoding this category according to Home Office Counting Rules (with an extra category of Motoring offences) (Home Office, 2010). As most[8] of these variables were derived from the fixed format fields of the CRIS reports, reliability tests were not carried out.

2.3.4 Spatial variables

The spatial variables used are outlined in Appendix Seven. These are *Number of locations* (continuous 1-4), *Type of location* (categorical - *Indoor private: Suspect's house, Victim's house; Indoor semi-public: Bus or train station, Car park, Nightclub, Public toilet, Shop, Stairwell, escalator, lift; Outside semi-public: Garden; Outside public: Alleyway, footpath, subway, Park, common, open space, cemetery, Street; Private transport: Car; Public transport: Bus or train*), *Transportation* (categorical - *Bicycle, Bus, Car, Foot, Train*), *Location set*[9] (categorical - *IAACVR, IA_ACVR, IA_A_CVR, IA_A_C_VR, IAA_C_VR, IAA_CVR, IAA_C_VR, IAAC_VR*), *Distance travelled within offence* (continuous, measured in kilometres), *Geo-mobility style* (categorical – *Intruded, Ambushed, Abducted, Followed*). The *Number of locations, Types of location, Transportation* and *Location set* were derived from content analysis of the victims' statements (as described below and in Chapter Four). The *Distance travelled within offences* was measured by calculating the distance between the *Initial approach location* and the *Crime location* (in the same manner as described above).

[8] The address of the *Initial approach location* was derived from the victim statements or other details of the CRIS report (as explained presently). It was not possible to double-check the accuracy of the address of initial approach because no other researcher was permitted access to this information. Therefore, the *Distance to Initial approach location* may be seen as 'less accurate' than the other distance measurements and the limitations of using this measurement are noted.

[9] This describes the locations used and whether there was movement between the locations. *Initial approach location = IA*; *Attack location = A*; *Crime location = C*; *Victim release location = VR*; Movement is denoted by _. Therefore, *IA_ACVR* means that there was movement between the *Initial approach location* and the *Attack location* but after that, there was no movement and the *Attack*, Crime and Victim release locations were one and the same.

The *Geo-mobility styles* were derived using thematic analysis (as described below and in Chapter Four).

All variables (except distance measures) were coded dichotomously, based on whether the behaviour was present (1) or absent (0). This unobtrusive method of analysing qualitative data is often used when coding police data that is not collected for research purposes. Previous studies have claimed that using non-dichotomous coding within the content analysis of police data could be unreliable (Canter & Heritage, 1990).

As all (except the distance measure) were derived through content or thematic analysis, the inter-rater reliability of the coding of the variables was carried out with the help of two other coders (one a lecturer in Psychology and the other, a fellow post-graduate student). Both had experience of coding information from victim statements and police data in the past and extra guidance, specific to the coding dictionaries was given. The details of the inter-reliability analysis for the spatial variables are given in Chapter Four. In sum, a sample of 12 cases were coded (for all variables) by two other researchers. The values of Cohen's Kappa (Cohen, 1977) were then calculated and are shown in the Results section. As Fliess (1981) has suggested, values of 0.6 to 0.75 are considered 'good', whilst a Kappa value of above 0.75 is deemed 'excellent.' The Kappa values for the *Number of locations*, *Type of location (Initial approach), Type of location (Attack location), Type of location (Crime location), Type of location (Victim release location), Transportation*, *Location set*, and *Geo-mobility styles* were 1.00, 1.00, 1.00, 0.99, 0.99, 1.00, 0.96 and 0.98 respectively, showing excellent inter-rater agreement.

2.3.5 Offence behaviour variables

A coding dictionary was developed that outlined the variables pertaining to the offence behaviour (Appendix Eight shows the first version of the coding dictionary, Appendix Nine shows the final version of the coding dictionary). Sturidsson, Långström, Grann, Sjöstedt, Åsgård, and Aghede (2006, p.221) argue for "better empirical support for the inclusion of specific variables in coding formats for crime scene information." As much as possible, the present study tried to use strict criteria for the inclusion of specific variables, through the careful consideration of the literature and the inter-rater reliability of the variables used. For more information on the development of the offence behaviour coding dictionary, see Chapter Five. In sum, The derivation of these variables was also conducted with close examination of coding dictionaries developed in other behaviourally based classification systems (for example, Dale, Davies & Wei, 1997; Canter et al., 2003;

Häkkänen et al., 2004). Again, the inter-rater reliability of the coding of the variables was carried out with the help of the two other coders. All variables selected for the final coding dictionary had a Kappa value of over 0.75 (see Appendix Nine for the Cohen's Kappa scores for each variable within the final coding dictionary). Again, all variables were coded dichotomously, based on whether the behaviour was present (1) or absent (0).

2.4 Design and Analytical techniques used

2.4.1 Chapter Three

Chapter Three uses the *Stranger rape sample* (*N* = 112) to establish the nature of the stranger rapes in terms of the timing of offences and the background characteristics of both victims and offenders. Therefore, the variables used within this chapter are the *General offence variables* (Appendix Four), *Victim background variables* (Appendix Five), and *Offender background variables* (Appendix Six). Only appropriate descriptive analysis was carried out within this chapter. Therefore, frequencies, percentages, suitable measures of central tendency, standard deviations and ranges are given for the variables outlined above.

2.4.2 Chapter Four

Chapter Four examines the spatial nature of the offences within the *Stranger rape sample* (*N* = 112) by 1) giving a descriptive account of the distribution of offences within London, the number and types of locations used, any movement between locations, and the distance travelled within offences and 2) using inductive thematic analysis (Glaser & Strauss, 1969) in the manner presented within Braun and Clarke (2006) to draw out the main themes relating to the offenders' *within* offence mobility. Therefore, for the first part of the chapter, the *Spatial variables* (as outlined in Appendix Seven) were used. These were derived using content analysis which can be described as the way in which "the researcher evaluates the frequency and saliency of particular words or phrases in a body of original text in order to identify key words or repeated ideas" (Namey, Guest, Thairu, & Johnson, 2008, p.138). The researcher read and re-read the victim statements, making notes about the behaviours exhibited within the statements before the content analysis was conducted (as suggested in Namey et al., 2008). Some of these variables were derived from the thematic analysis of the offenders' spatial behaviour as *Codes* and *Sub-codes* (see below for more details).

Each victim statement was examined and extracts relating to the spatial behaviour of the offender within the offence were identified. These were defined as being all sections that pertained to the physical locations described within the offence, any movement of the

offender independent of the victim, any movement that the offender forces on the victim and any methods of transportation used within the offence. Appropriate descriptive analysis was carried out for these variables; frequencies, percentages, suitable measures of central tendency, standard deviations and ranges were used.

The second part of the chapter was concerned with the thematic analysis of the spatial mobility within the offence. Again, each victim statement had been examined and extracts relating to the spatial behaviour of the offender within the offence had been identified. An inductive or 'data-driven' thematic analysis of the spatial aspects of the rapes was carried out (Glaser & Strauss, 1969). An in-depth account of the six phase process of the thematic analysis (as described within Braun & Clarke, 2006) is given within Chapter Four.

2.4.3 Chapter Five

The aim of Chapter Five was to model the offence behaviours from the 112 offences. Thus variables outlined in Appendix Nine were used. These variables were derived from the content analysis of the 112 victim statements. Each victim statement was examined and extracts relating to the offence behaviour exhibited by the offender were identified. These were defined as being any verbal or non-verbal behaviour (excluding any movements from one place to another) that the offender used from the initial encounter until the offender left the scene. This included behaviours that the victim explicitly stated did *not* happen. An in-depth account of content analysis and the development of the content dictionary are given in Chapter Five.

The first half of the chapter gives the frequencies of the offence behaviours found within the sample, alongside narrative examples. The second half of the chapter is concerned with testing whether the offence behaviours could be differentiated into the hypothesised themes, the statistical technique of Smallest Space Analysis (SSA-1, Lingoes, 1973), a multivariate data reduction procedure, was conducted.

Smallest Space Analysis is a non-parametric multidimensional scaling (MDS) technique developed from Facet Theory (Guttman, 1979) that graphically represents the relationship between variables. MDS procedures such as SSA have been used to guide exploratory research within the social sciences, reformulating existing theory and creating new directions in research. Such techniques have been used within research to classify behaviours within a wide range of crimes including rape (e.g. Canter et al., 2003; Canter & Heritage, 1990) and sexual homicide (Salfati & Canter, 1999).

The Hebrew University Data Analysis Package (HUDAP, v.5.0) (Amar, 2005) was used to carry out the SSAs within the present study. Essentially, it calculates correlation coefficients between variables within a data matrix and places these values into a rank order. The matrix is changed into an association matrix, consisting of the correlation coefficients. These can then be represented as points in space where the rank order of correlations are inversely proportional to the rank ordering of distances between points. The computer software performs a series of iterations on the distances between points to best reflect the rank order of correlations. A 'coefficient of alienation' (Borg & Lingoes, 1987) is produced to measure the goodness of fit of the representation and indicates how well the co-occurrences in the association matrix are represented in the spatial illustration. In general, there is not a standard answer as to the 'best' value for the coefficient as this depends on various alternative calculations (Borg & Lingoes, 1987). However, in general, "the smaller the coefficient of alienation is, the better the fit" (Salfati & Canter, 1999) and Lingoes (1973) states that any value less than 0.25 is deemed an acceptable coefficient.

The SSA structure can be examined in terms of any spatial contiguity that may occur. As SSA is "based upon the assumption that underlying structure, or system of behaviour, will most readily be appreciated if the relationship between every variable and every other variable is examined" (Canter & Heritage, 1990, p.192), variables shown closer together on a graphical representation will share similarities in some underlying empirical structure. Thus, SSA was used to examine the co-occurrence of the offence behaviours within the sample; variables that occurred within particular regions in the plot were considered to represent a similar underlying structure. Usually, behaviours can be partitioned within different areas on an SSA plot, which are said to relate to various psychological themes

Once themes within the plot were identified, Kuder-Richardson 20 (K-R 20) scores were calculated to measure the internal reliability of each region. This is a similar measure to Cronbach's Alpha but is for use within dichotomous data (Canter, et al., 2003).

In summary, the SSA was used to explore the co-occurrences of the rape behaviours and allowed for the testing of the hypothesis that the behaviours could be differentiated into themes.

2.4.4 Chapter Six

The first part of Chapter Six explores the relationship between the *Geo-mobility styles* (derived in Chapter Four) and the *Individual offence behaviours* (derived in Chapter Five). Cross-tabulations are therefore given, using Pearson's Chi-Square Test for significance (χ^2),

using Fisher's Exact Test if any of the cells within the contingency tables were less than 5 (Fisher, 1922). The phi coefficient (ϕ) was used to measure effect sizes (Sheskin, 1997).

The next aim was to consider the Geo-mobility styles alongside the behavioural model. This was carried out by considering the four geo-mobility styles as external variables on the SSA plot. External variables are those which have "a vector of similarity coefficients" (Amar, 2005, p.163) with the coefficients on the original SSA plot. Therefore, external variables can be placed on an SSA plot, and their occurrence can be considered alongside the original variables but their presence does not affect the overall monotonicity of the plot. Equally, if more than one external variable is used, the inter-relationship between the external variables is not considered (Amar, 2005). Therefore, as the geo-mobility styles are mutually exclusive (each offence can only be classified within one of the styles), they were not able to be considered within the original plot. Considering them as external variables ensures that their relationship with the behavioural variables (and each other) does not influence their relationship with the SSA plot as a whole.

2.4.5 Chapter Seven

Chapter Seven examines whether the Geo-mobility styles are associated with the offenders' background characteristics. Alongside this, other spatial and offence behaviours (those which were considered for the SSA) are examined to consider their relationship with the offenders' background characteristics. Therefore, the variables used within this chapter are the *Offender background variables* (Appendix Six), the *Spatial variables* (Appendix Seven) and *Offence behaviour variables* (Appendix 10).

Within this chapter, the *Spatial variables* and *Offence behaviour variables* were the independent variables, whilst the *Offender background variables* were the dependent variables. In total, there were 15 independent variables used and 56 dependent variables used (see the Methods section in Chapter Seven for further details).

To examine the associations between categorical independent and dependent variables, cross-tabulations showing percentages were calculated. Chi-square analysis was used to examine whether any differences between cells were statistically significant (Pallant, 2007). (For a full list of the cross-tabulations and Chi-squares that were carried out, please see the Methods section in Chapter Seven). Some of the 2 x 2 contingency tables violated the Chi-Square assumption that the frequency of the expected cells should be at least 10 and

Fishers Exact test was conducted as an alternative (Pallant, 2007). Phi associations were used to measure effect sizes (Sheskin, 1997).

To examine the effect the categories of the independent variables had on the dependent variables, appropriate descriptive and inferential statistics were reported. The distribution of the continuous dependent variables was examined using a Kolmogorov–Smirnov test to establish whether distributions were normally distributed (Pallant, 2007). For independent variables that had more than two categories (for example, the *Geo-mobility styles*), either the parametric One way Analysis of Variance Analysis (ANOVA) test (the Welch and Brown-Forsythe test if Levene's Test for Homogeneity of Variance was significant) was adopted or the non-parametric Kruskal Wallis test was carried out (Pallant, 2007). For independent variables that had two categories (for example, *Offence behaviours*), the parametric Independent T-test was carried out or the non-parametric Mann Whitney U test was adopted (Pallant, 2007). For the One way ANOVA, effect size was measured using Eta Squared (η^2) derived from the results from the One Way ANOVA by dividing the sums of squares between groups by the total sums of squares (Pallant, 2007). The effect size of Kruskal Wallis tests were calculated if the result was significant and after post-hoc Mann Whitney U tests had been undertaken between the various categories to see where the differences lay. Therefore, the effect size was calculated using the formula $r = Z/\sqrt{N}$ from the Mann-Whitney U tests (Newcombe, 2006). The effect size used for the Independent T-Test was Cohen's *d* (Pallant, 2007) (calculated using an Effect Size calculator from http://www.uccs.edu/~faculty/lbecker/).

Due to the high number of inferential tests that were carried out on each dependent variable (52), this increases the chance of making a Type 1 error (that is, finding an association or a significant difference from the tests when there is not one) (Howell, 2002; Pallant, 2007). To correct for this, the error rate (set at 5% for this study) was divided by the number of tests to be carried out on the dependent variable (often referred to as a Bonferroni adjustment). For this reason, therefore, the adjusted alpha for this section of the chapter was .0009.

Having examined the associations between the spatial and offence variables with the offender characteristic variables, those which had a significant inferential test result were put forward for bivariate logistic regressions. This was to consider if and how the independent variables predicted the dependent variables. Before this was considered, some of the dependent variables had to be dichotomised so that they could be compared against each other for predictive accuracy. This process is explained in full within Chapter Seven (and was

only carried out on dependent variables that were found to be significantly related to the independent variables).

Logistic regression is a multivariate statistical technique used to predict an outcome variable using one or more predictor variables. Taking a set of observations, logistic regression suggests a model that best fits these observations. Specific to logistic regression, the outcome variable is categorical whereas the predictor variable(s) can be categorical, continuous or a combination (Tabachnick & Fidell, 1996). Sometimes, this outcome variable is a probability that ranges from 0 to 1. In this chapter, logistic regression was used to see how well the spatial or offence behaviours (the independent variables) were at predicting group membership (that is, the particular offender background characteristic). Therefore, bivariate logistic regressions were used, which, by default is an enter model method. This is a technique recently used by Goodwill et al., (2009) to compare how well the MTC (in its third revision), Canter et al's (2003) model of rape behaviour and individual offence behaviours could predict various offender background characteristics.

Before carrying out the logistic regression, the assumptions of logistic regression had to be examined to ensure that they were not violated. Firstly, the number of cases per independent variable was considered. As Peduzzi, Concato, Kemper, Holford, and Feinstein (1996) argue, to minimise 'major problems' occurring within logistic regression, the number of 'events per variable' (EPV), should be at least 10 for each independent variable within the model. Therefore any significant associations with a spatial or offence behaviour where the number of cases where there was a '1' that was less than 10 was excluded from the logistic regression.

As the logistic regressions, were bivariate, there was no need to test the assumption of multicollinearity.

Outliers and influential cases were assessed (Tabachnick & Fidell, 1996). Firstly, a baseline model was run (including all cases) to examine each of the *Offender background characteristics*/*Spatial* or *offence behaviour* pairings. Then, all outliers (which were considered those cases where their standard residual was less than 3.0 or more than 3.0) and influential cases (those whose Cook's distance was greater than 1.0) were removed. Where the accuracy of the model with these cases removed was greater than the baseline model, the new model was used to assess the predictive accuracy of the particular aspect. However, no outliers or influential cases were found for these variables.

The Hosmer and Lemeshow Goodness of Fit Test was used to examine how well the data fits with the model. The null hypothesis of this test is that observed values fit the

regression model; therefore, the 'ideal' outcome of this test is that the null hypothesis is accepted (Hosmer & Lemeshow, 2000). The Hosmer and Lemeshow Goodness of Fit Test is calculated by dividing the cases used into deciles based on their predicted probabilities. For each decile, the observed and expected frequencies are cross-tabulated and Chi-Square Statistic is then used to test whether there is a significant difference between the observed and expected frequencies. If this difference is significant, it means that the data is not a good fit for the model. Therefore, an ideal Hosmer and Lemeshow Chi-square value is non-significant.

Receiver Operator Characteristics (ROC) was used to test the predictive accuracy of the models derived from the logistic regressions (Swets, 1988). Usually used in clinical studies, for example to test the accuracy of a test for cancer, this tool can be used to see how accurate a measure is at predicting group membership. In diagnostic terms, a decision can have one of four outcomes. These can be: making a decision that something is true (for example, that someone has cancer) and it is true (a 'Hit'); making a decision that something is true and it is false (a 'False Alarm'); making a decision that something is false and it is true (a 'Miss'); making a decision that something is false and it is false (a 'Correct Rejection.'). The estimated probabilities generated by each of the logistic regression models are used within the ROC analysis. This generates an Area under the Curve (AUC) statistic and displays this on a graph. This AUC statistic assesses the likelihood or probability that the decision outcome is a 'Hit' (*p*H) and, at the same time, assessing the likelihood or probability that the decision outcome is a 'False Alarm' (*p*FA). As Goodwill et al., (2009, p.514) argue, the advantage of using the AUC statistic is that it provides "a measure for predictive accuracy "independent of decision thresholds, like logistic regression classification tables."

The AUC, therefore, shows the relationship between the *p*H and the *p*FA and is therefore a measure of predictive accuracy. In the case of the present chapter, this is how accurate the spatial or offence behaviours are at predicting a particular offender background characteristic. The ROC analysis plots the value of the AUC on a graph, with its value ranging from 0 to 1, where 1 is 'perfect' accuracy and 0.5 is the random, or chance, level of accuracy.

In sum, both logistic regression and ROC analysis are used to examine of the accuracy of the spatial or offence behaviours at predicting offender characteristics.

2.4.6 Chapter Eight

Chapter Eight considers the Serial stranger rape sub-sample, consisting of 17 series.

Although some of the 17 series consisted of three or four offences, it was necessary to have the same number of offences in each series, which is common practice in linkage analysis research (Woodhams & Toye, 2007; Bennell & Canter, 2002; Bennell & Jones, 2005). Therefore, for series that consisted of more than two crimes, two were randomly selected (using a function in SPSS v.17©) for inclusion in the analysis. For the linkage analysis, 17 linked series were used, comprising of a total of 34 offences, two offences per offender. These will be referred to hereafter as the *Linked pairings*.

In order to examine how effective the spatial and offence behaviours were at linking offences, it was necessary to compare their results to that of an unlinked sample. Thus, a random sample of unlinked pairings was selected using a function in SPSS v.17©. These will be referred to hereafter as the *Unlinked pairings*.

A total of 34 crime pairings are therefore used in the linkage analysis; *17 Linked pairings, 17 Unlinked pairings.* For the linkage analysis within Chapter Nine, the dependent variable is whether a pairing is either *Linked* ('1') or *Unlinked* ('0'), whilst the independent variables are the various spatial and behavioural aspects that have been derived from the victim statements.

Chapter Eight uses *Geo-mobility styles*, *Spatial variables* and *Offence behaviour variables* described in Appendices 6, 7 and 10. *Inter-initial approach distances* and *Inter-Crime distances* (both measured in kilometres) between pairs of crimes are also used.

A descriptive analysis of the variables (for the whole of the sub-sample) was carried out, using percentages and appropriate measures of central tendency.

The first aim of the chapter was to establish whether linked pairings were more consistent than unlinked pairings (please see Chapter One for a definition of consistency). Consistency was established for *Geo-mobility style*, *Type of location*, *Transportation*, and the individual *Offence behaviours* by comparing the percentage of 'matches' (that is, the number of times the same behaviour is observed in both crimes within pairings) between the Linked and Unlinked pairs of offences. Any differences were compared using Chi-square analysis and effect sizes were examined using phi (Sheskin, 1997).

Consistency was established for *Inter-Initial approach* and *Inter-Crime distances*, if the distances were significantly shorter in the *Linked pairings* compared with the *Unlinked pairings*. The distributions of the *Inter-Initial approach distances* for *Linked* and *Unlinked pairings* were examined for normality. This was determined using a Kolmogorov–Smirnov test, a method used in similar studies such as Markson et al., (2010) and Woodhams (2008). Appropriate descriptive and inferential statistics were then applied.

Additionally, overall offence behaviour was also examined to establish whether the overall offence behaviour exhibited was more similar across the *Linked pairings* than it was across the *Unlinked pairings*. Similarity was measured using Jaccard's coefficient which is a measure of association that does not take into consideration joint non-occurrences (Jaccards, 1908) and has been used to assess similarity in other similar studies (for example, Woodhams &Toye, 2007). Jaccard similarity scores were calculated using the Hebrew University Data Analysis Package (HUDAP, v.5.0) (Amar, 2005). Again, the distribution of the Jaccard's scores was examined and appropriate descriptive and inferential tests were adopted.

The second aim of the chapter was to examine whether any of the *Spatial* or *Offence behaviours* could accurately predict whether the crime pairing was linked or unlinked. Therefore, any consistent aspect of the offence was examined within a bivariate logistic regression model to consider whether they could discriminate between linked and unlinked pairs and therefore establish inter-offender variation (please see Chapter One for an explanation of inter-offender variation). In addition, all consistent variables were considered to be entered into a forward left-right stepwise logistic regression to examine whether an 'optimum' model could be used with a combination of these aspects.

Before the logistic regressions were carried out, their assumptions were considered, as explained within the Chapter Seven section. Additionally, for the forward step-wise regression, the independent variables were assessed for multicollinearity; those that were highly correlated (over 0.7), were disregarded for the analysis (Tabachnick & Fidell, 2001).

After the logistic regressions were conducted, ROC analysis was performed. In this chapter, this was to determine the accuracy of the spatial or offence aspects at predicting linkage. ROC is also used as an alternative to logistic regression because, in logistic regression, the dependent variable used is typically independent (Lewis-Beck, 1980 as cited in Bennell & Canter, 2002). In this study, as with others, the linked and unlinked pairs were not statistically independent from each other (as they were drawn from the same sample). This could affect particular measures of predictive accuracy (Bennell & Jones, 2005; Woodhams & Toye, 2007). Therefore, ROC was used to counter-act this violation. Finally, after ROC analysis was performed, the Youden's index for each ROC model was conducted. Youden's indices are used to identify the decision threshold that maximises the hit probability and minimises the false alarm probability. Decision thresholds correspond with p values from the logistic regression and from there, the researcher is able to identify the particular value (or presence or absence) of the variable that this corresponds to. Youden's Index is calculated using the formula $J = pH + pCR - 1$.

CHAPTER THREE
THE NATURE OF STRANGER RAPE IN LONDON

The following chapter offers a descriptive analysis 112 stranger rape offences that were recorded within the Metropolitan Police Service's Crime Recording Information System (CRIS) from 1st May 2004 to 31st December 2006. The main focus of this chapter is to establish the nature of the stranger rapes in terms of the timing of offences and the background characteristics of both victims and offenders. In particular, it will examine the offence histories of the offenders, including the extent to which the offenders have committed previous sexual offences against strangers. There were 114 victims within the offences; three-quarters were aged under 30 and White. One hundred and thirty one offenders were arrested for the offences; similarly, three-quarters were under 30 but the majority of offenders were of Afro-Caribbean ethnic appearance. Most of the offenders had at least one other offence (where the offender had been arrested and charged with an offence), recorded on CRIS. The highest percentages of offences (in descending order) were *Violent*, *Theft*, *Robbery*, *Drugs*, *Sexual* and *Burglary offences*. Over three quarters of offenders were aged 25 or under at their first offence recorded on CRIS. *Median distances travelled to previous offences* were less than 2.5 kilometres, whilst *Mean-inter-point distances between previous offences* were less than 5 kilometres. Implications for operational and strategic policing are discussed.

3.1 Introduction

3.1.1 Previous descriptive studies

The following section gives a brief overview of previous studies examining stranger rape. These studies will be used to compare against the research findings within this chapter. Such studies include the use of police records as a data source, those that use medical records and those that draw conclusions from victim surveys.

3.1.2 Studies using police and Criminal Justice System data

The studies using police records and other data drawn from the Criminal Justice System are usually focused on three main areas. Firstly, they seek to provide a picture of the reported level of rape in terms of victim-offender relationship as well a summary of the central characteristics of the location, timing, victim and offender characteristics. Secondly, they examine the factors associated with case attrition ('dropping out' of the Criminal Justice

System). Thirdly, studies centre on examining whether offenders are 'specialist' sex offenders or versatile offenders by considering previous offences and recidivism rates.

A study, pertinent to the present research, was carried out by Ruperal (2004), outlining the nature of all rapes (detected and undetected) perpetrated towards females within the Metropolitan Police Service district for a two year period, between 2001-2003. In 'over 5000' offences, Ruperal (2004) found that stranger rapes accounted for 36% of all victim-offender relationships, second only to acquaintance rapes. The general results may differ slightly to the current study as it was carried out before the Sexual Offences Act (2003). The new *Actus Reus* within this included acts of penetration of the mouth, which was not considered as rape in the previous Sexual Offences Act (1956). Therefore, Ruperal (2004)'s study would not have considered forced fellatio within rape cases, whilst the present study does.

Muir and McLeod (2003) examined the nature of 172 rapes and attempted rapes recorded with a large metropolitan police force within the UK in 1993. They found that stranger rape accounted for 20% of their sample and that there was a significant association between victim-offender relationship and victim age. In particular, victims aged between 15 and 24 were more likely to be raped by a stranger or an acquaintance than an intimate offender.

A more recent study, using police data was carried out by Feist et al. (2007), on behalf of the Home Office, and aimed to explore attrition in reported offences of rape against females from eight police forces within England and Wales. Using the records of 676 rapes recorded between 2003 and 2004, the authors found that stranger rapes accounted for 14% of their sample.

Woodhams (2004) specifically examined the nature of juvenile sex offending (offenders aged less than 18) against strangers by examining 496 reported offences from the Metropolitan Police Service in 2001. As part of this study, she recounted that juvenile offenders were responsible for 14% of the reported stranger rape offences within that year in the MPS.

MPS (2005) undertook a review of rape investigations within the MPS over 2 months in 2005. The authors tracked all rapes recorded within this time, for both male and female rapes, examining the factors that could be related to the outcome of rape cases, in an attempt to improve services given to victims of rape and sexual assault. The force identified 697 allegations of rape within that time period; 10 of which were redirected to other Forces (as they had occurred outside of the MPS policing area), 10 allegations were ascertained as being

false allegations and were therefore excluded from the analysis. The unique nature of this study was that it examined all 'statuses' of crime. Therefore, it recorded how many offences were recorded as 'crimes' (as opposed to 'no crimes' which turned out not to have happened or to have been a false allegation). From the entire sample, 511 offences (75.5%) were found to be crimes. It is important to note that 'No crimes' can also be those which have been reported to the Sexual Assault Referral Centres (described below) but where the victims do not wish to report the offence to the police. This "enables victims to access medical welfare and support without having to go through with a police investigation and possible prosecution" (MPS, 2005, p.11). If the Home Office agrees, the MPS can record these offences in order to gather intelligence and record these as 'Not crimes.' In this study, it was found that 19.8% of offences (134 cases) were recorded in such a manner. In terms of the levels of stranger rape within the sample, reports of such offences were found to constitute 26% (175) of all allegations.

Other studies have tracked offences through the Criminal Justice System. Harris and Grace (1999) followed 500 reports of rape recorded by the police and the Crown Prosecution Service (CPS) in 1996. This was to examine whether there were common factors between cases that led to a successful prosecution and whether these factors had changed in comparison with a previous Home Office report (Grace, Lloyd, & Smith, 1992). Harris and Grace (1999) found that 12% of the cases had been committed by a stranger; a figure much lower than the 30% found within the Grace et al. (1992) study. In terms of attrition, the researchers found that 6% of the cases that had been initially recorded by the police had ended in a conviction. Allegations of a rape perpetrated by an acquaintance were most likely to be 'No-crimed' whilst allegations of a rape perpetrated by an intimate were most likely to be discontinued by the Crown Prosecution Service (CPS). Where an offender had been identified in a stranger rape, these cases were most likely to continue to a trial than rapes perpetrated by individuals that were known to the victim.

Descriptive studies which examine pre- or post-convictions of rapists are usually aimed at establishing whether sex offenders have already committed or go on to commit the same types of offence. As previously examined in Chapter One, there has been some evidence to suggest that some offenders target specific victims repeatedly (for example, Sjöstedt et al., 2004)

There are advantages of using records from the Criminal Justice System as a way of examining the nature of stranger rape. Firstly, stranger rapes are more likely to be reported to the police (for a review, see Bryden & Lengick, 1997) and, therefore, the examination of stranger rape may give a more accurate picture of victim and offender characteristics as opposed to rapes perpetrated by a known offender. Secondly, assessing the nature of stranger rapes from historical police data gives the police an idea about the sorts of issues they may have to deal with in the future. Thus, and as emphasised in Chapter One, such endeavours are important in terms of intelligence gathering. This is crucial in order to implement preventative methods (such as raising potential victims' awareness), to plan for strategic techniques (such as the tracking of PPOs) and to effectively investigate offences when they happen (for example, suspect prioritisation and case linkage).

The limitations of using police records as a source of data is well-documented (please see Ainsworth, 2001 for a review). The main drawback is that many rapes go unreported to the police; Walby and Allen (2004) estimate that only 15% of rapes are reported. The decision by the victim not to report the rape is thought to be associated with a number of factors, including fears about the investigation and trial process, the traumatic nature of having to relive the rape again, feelings of shame, embarrassment, guilt or fear of retribution. If the crime is reported, there are often problems with being able to apprehend an offender or the victim may decide to withdraw their complaint (Kelly, Lovett, & Regan, 2005). Other limitations have already been discussed within Chapter Two.

3.1.3 Studies using medical data

A more representative picture of stranger rape may be given by studies using medical records as a source of data. Such a source of data can be from referrals into Sexual Assault Referral Centres (SARCs). These are specialist medical centres (often located within hospitals) that specialise in treating rape victims directly after they have been raped or sexually assaulted. Referrals to SARC can be from the police but also these can be from the victims themselves or from other avenues (for example, General Practitioners) (Lovett, Regan, & Kelly, 2004). It maybe, therefore, that some rapes recorded within these establishments may not be recorded by the police at all, thus, perhaps, showing a "truer picture" of the levels of rapes in the UK.

Two similar studies have been carried out, examining the characteristics of victims seeking help within two SARCs; one in the North of the UK, one in the South. Kerr, Cottee, Chowdhury and Welch (2003) found that just over a half of victims (N = 676) who sought

help within the Haven, a SARC based in King's College Hospital in southeast London, between May 2000 and May 2001, had been raped by a stranger. Similarly, McLean and Balding (2002) examined the characteristics of over 7,000 rapes and sexual assaults reported to the St Mary's SARC in Manchester from 1986 to the end of 2001, finding that over a third of their clients had been raped by someone that was unknown to them.

Other studies examining the nature of rape drawn from the examination of victim's medical notes have also been carried out in other parts of the UK. Bownes, O'Gorman, and Sayers (1991), for example, carried out a study in Northern Ireland, highlighting the differences between stranger and acquaintance rape victims who had been assessed for medico-legal purposes from 1983 to 1988. These victims were seeking compensation for their rapes. Within this sample, Bownes et al. (1991) found that 58% of victims had been raped by a stranger.

Similar studies have been carried out across Europe, the USA and Canada. For example, Grossin, Sibille, Lorin de la Grandmaison, Banasr, Brion and Durigon (2003) examined the characteristics of rape victims who had received a medical examination in a 1 year period, in a suburb of Paris in 1998. All types of victim-offender relationships were considered, for both males and females. The aim of the study was to examine the differences between people who were examined within and after a 72 hour period. The researchers found that 51% of victims who were examined within a 72 hour period were attacked by strangers, whilst this figure went down to 8% for victims who presented after 72 hours.

Sugar, Fine, and Eckert (2003) examined the characteristics of female sexual assault victims who had accessed the emergency department of an urban hospital in Denver, USA. The 3 year study (1992-1995) documented the extent of physical injuries in victims of both stranger and acquaintance rape. The study examined associations between injuries with victim and situational factors and found that higher levels of "general body injury" was more likely in stranger assaults , when there was oral or anal penetration, when a weapon was used and when the offender exhibited higher levels of violence towards the victim. More specific injury to the victims' genitals and anus was found to a greater extent within victims who had no previous sexual experience or where younger, but were sexually experienced.

In a similar setting, in Colorado, USA, Magid, Houry, Koepsell, Ziller, Soules and Jenny (2004) compared the presentations of female sexual assault victims within a 5 month period in both 1974 and 1991 to see whether there were different trends between the 2 years. Victims of both stranger and acquaintance rapes, over 14 years at the time of the rape, had increased 60% over the 2 time periods, but the reporting of stranger rapes had stayed

relatively stable; the increase in rapes was almost all accounted for by an increase of acquaintance rapes.

Jones, Wynn, Kroeze, Dunnuck, and Rossman (2004) carried out a comparison of stranger and non-stranger assaults from a community-based centre for victims in Michigan, USA over a 40 month period. The main aim of the study was to examine whether physical violence and coercion, injury and trauma were associated with the victim-offender relationship. Twenty-eight per cent of the population were assaulted by a stranger. A similar study was carried out by Riggs, Houry, Long, Markovchick, and Feldhaus (2000) who examined the characteristics of victims of 1076 cases of sexual assault admitted to a medical centre, finding that within 39% of cases, victims had been assaulted by a stranger.

Although the above studies may give a more representative picture of the level of rapes that may be lost within police records, using medical records as a source of data to investigate the nature of stranger rape does have its drawbacks. Firstly, SARCs and hospitals are often based in urban settings. Therefore, results derived from these contexts may not reflect the nature of rape in more rural areas. Secondly, medical centres may have different methods of clinical evaluation. Therefore, variations in results between different centres may reflect different protocols. Thirdly, the type of information recorded within studies using medical data might not include variables such as offender characteristics; often, the methods used to collect information include standardised forms. Therefore, information added to these will be static and pre-defined; other information and variables that may be useful might not collected (C/F Alison et al., 2001; Newman, 2008). Fourth, some medical studies only use data from victims who are seeking compensation for their rape and therefore the offenders have been convicted of the offence (for example, Bownes et al., 1991). As Myhill and Allen (2004) purport, stranger rape offences are more likely to be reported to the police, and, as Harris and Grace (1999) found, in the minority of stranger rape cases where an offender was identified, they are more likely to be convicted than those that reached court and were committed by an acquaintance or other known. Therefore, levels of stranger rape may be over-represented within these samples.

3.1.4 Studies using victim surveys

Researchers often use victim surveys as another data source. For example, the British Crime Survey (BCS) is the largest adult victim survey in the UK and is carried out annually. The survey consists of face-to-face interviews but respondents can key their responses on to laptops to ensure anonymity. Myhill and Allen (2004) reported the results from the BCS from

2000, from respondents who had been raped or sexually assaulted since the age of 16 or within the last year. The sample reported were females who were over 16. They and found that 8% reported having been raped a stranger, of which 36% of cases had been reported to the police.

Similarly, results from the 2004-2005 British Crime Survey indicate that levels of rape perpetrated by strangers are low compared to other forms of rape, at a level of 11% (Nicholas, Povey, Walker & Kershaw, 2005). More recently, Finney (2006) reported the findings from the BCS between 2004 and 2005, including details of both female and male victims. Eleven per cent of victims had been raped by strangers. In sum, the figures reported from the BCS seem to have remained stable over recent years and show that only approximately a third of stranger rape cases seem to be reported to the police.

Other studies involving victim surveys have been carried out internationally. For example, Ullman, Filipas, Townsend, Starzynski (2006) conducted a mail survey in the USA, recruiting participants through college and mental health agencies. The researchers were interested in comparing the experiences of females who had been raped by a stranger versus a non-stranger since the age of 14. They found that 20% of victims had been raped by a stranger.

There are many advantages of examining the levels and the characteristics of stranger rape through the use of victim surveys. Victims may often feel fear or concern about reporting rape to the police and therefore may not do so. Therefore, findings from such studies may provide a more accurate picture of rapes perpetrated by strangers. For the victim, the use of questionnaires (for example in the Ullman et al., 2006 study) ensures the victim has anonymity and may feel secure in answering particular questions. From a methodological perspective, the researcher can also more readily control for the variables that they are interested in researching.

There are, however, limitations with the use of this methodology. Victim surveys may be subject to sample bias. Some populations are under researched and difficult to study (for example, rape victims who are male or levels of rape within vulnerable populations such as prostitutes or homeless people victims). Therefore results may give unrepresentative results. Further, the traumatic nature of the event itself may distort the victims' view of events (Burgess & Holmstrom, 1974; Holmstrom & Burgess, 1975). Thus, they may place more emphasis on certain details of the event and may not remember others. Because of the self-report methodology used within these studies, it may be impossible to clarify information that is given by the victims. Studies using police data will have other information (such as witness

accounts or medical reports) that will help to clarify particular aspects of the accounts. For example, if the victim is unsure about whether the offender ejaculated, the Forensic Medical Examiner's report may be used to ascertain whether semen was found on the victim's body.

Also, victim surveys mostly use adults within their samples (for example, the British Crime Survey asks questions of over 16 year olds). Therefore, the victimisation of younger victims may not be fully represented.

3.1.5 Rationale and research questions

The above section outlined pertinent studies examining levels and characteristics of stranger rapes, from police or other Criminal Justice Service records, victims' medical records and victim surveys. The results of these studies will be compared to findings from the present sample. Although the limitations of using data derived from police data have been recognised, as Chapter One outlines, the need for intelligence-gathering around crimes and those who have committed these crimes is crucial to ensure that the police have an understanding of particular crime types at a localised level (C/F level one of the National Intelligence Model). Thus, the present chapter outlines the nature of stranger rape within the MPS area from 1st May 2004 to 31st December 2006, in order to provide a picture of the timing of these offences, particular aspects of the victims of these crimes and an overview of the offenders' background characteristics. In summary, the chapter aims to examine:

- The timing (time, day of week) of the offences
- The victims' ages and ethnicity
- The offenders' background characteristics: Age, ethnicity, distance from the home base to the crime location, previous offence history (offences where the offender had been arrested and charged with an offence), age at first recorded offence, distances travelled to previous offences, distance between previous offences.

3.2 Method

3.2.1 Sample

The 112 stranger rape records held within the Metropolitan Police Service's Crime Recording Information System (CRIS) were used as the main sample for this chapter (the *Stranger rape sample*). These offences were committed between May 2004 and December 2006 and had been committed by 131 offenders against 114 victims. The 112 offences were recorded between 2004 and 2006; 38.6% of cases (n = 44) occurred in 2006; 37.7% of cases

(*n* = 43) occurred in 2005; 23.7% of cases (*n* = 27) occurred in 2004.

The offenders' offence history was derived from using the offenders' names, dates of births and any PNC numbers from the *Stranger rape sample*, and searching for their previous offences (where the offender had been arrested and charged with an offence) within CRIS. This process is further outlined in Chapter Two. Out of the 131 offenders from the main sample, 104 had previous offences on CRIS. Between these offenders, they had committed 899 offences. These offences were committed between 1990 and 2006 with the highest frequency of offences occurred in 2004 (16.5%, 148 cases).

As Chapter Two explains, each recorded offence is given a Crime Reference Number and has its own crime report. Officers input information pertaining to the crime onto the computerised CRIS system. Some information is recorded in a coded format; other information is recorded in free text. For the purpose of this chapter, mainly pre-coded information was used to derive the variables used.

3.2.2 Procedure

The variables used within this chapter are the *General offence variables* (Appendix Four), *Victim background variables* (Appendix Five), and *Offender background variables* (Appendix Six). Most of these variables were either derived from the fixed format fields. However the distance measures, *Distance to Initial approach location* and *Distance travelled to Crime location*, were derived by retrieving the addresses for a) the offender's home base, b) the Initial approach location (the location where the offender and victim first encountered each other) and c) the Crime location (the location where the offender committed or attempted to commit the rape), obtaining the geo-codes for each of these addresses (x and y map co-ordinates) and calculating the Euclidian ('crow-flies') distances between any two given points using Pythagoras' theorem.

In terms of the offender home base, where there was more than one offender within each rape, the median distance between home to initial approach or crime location was calculated for all offenders and this was used as the median distance travelled to initial approach and crime location. This process was conducted for 19 cases. The median distance was used as the distances travelled to both the initial approach location and the crime location were both found to be non-normally distributed, using the Kolmogorov–Smirnov test (*Distance to initial approach location*, $Z = 1.98$, $p < .0001$; *Distance to crime location*, $Z = 2.15$, $p < .0001$).

Chapter Two identifies the method the present author adopted to locate the address of the initial approach location. Descriptions that helped the researcher identify the initial approach location address included examples such as "Number X bus stop on ADDRESS", or "bus stop by the pub, on ADDRESS", or "Just off the bus stop, near old CAR garage, on the junction with ADDRESS." The researcher was able to use streetmap.co.uk © and Google Earth © to pin point these locations. As the present chapter goes onto explain, some offenders approached the victim and committed the crime in the same location and therefore, the initial approach location address will be the same as that recorded as the crime location by the MPS.

Chapter Two also identifies the way in which some of the crime addresses are often not recorded precisely, mainly because the offence happened in a park or outside a particular location. For the 112 offences examined in this chapter, 19 offences (16.96%) were recorded as being 'outside' a particular address, 14 offences (12.5%) were recorded as being within a park, common or other open park area, another 14 offences (12.5%) were recorded as occurring 'near' to a particular address, four offences (3.57%) were recorded as occurring 'opposite' an address, and two offences (1.79%) were recorded as happening on a road, without the precise address being recorded. This means that, out of the 112 stranger rapes that occurred, 47.32% of the crime locations could not be precisely pin-pointed. To deal with this, the researcher stripped away the 'near', 'opposite' and 'outside' descriptors and used the address given to derive the geo-code. For instances where the offence occurred in a park, unless a more accurate description was given (for example, next to a monument that the researcher could identify on map), the researcher found the geo-code for the very centre of the park or open space. For the two offences that occurred on a 'road', the researcher also took the geo-code from the very centre of those roads. Although this process was not ideal, the researcher was consistent and systematic in her way of dealing with these issues. It was estimated that often, the distances would only be inaccurate by a matter of metres, if at all. There were three offences (2.68%) for which the researcher could not pin point an initial location at all. All the crime locations could be identified.

Also discussed in Chapter Two is the way in which there are sometimes problems with the offender home base address data. For example, the offender may have been of 'No Fixed Address' or 'NFA' at the time of the rape. For the 131 offenders who had committed the stranger rapes, there were 14 (10.69%) offenders who did not have a fixed address, or it was unknown at the time of the offence. There was also one offender (0.76%) whose address was recorded as a prison. Therefore, for the sample of 112 offences, there were 15 home addresses that could not be identified.

In all, therefore, for the 112 stranger rape offences, 94 distances to initial approach location and 96 distances to crime location could be calculated. These are measured in kilometres.

For the *Distance to previous offences*, the distance for each crime each offender had committed in the past was calculated. For each offender, the median distance for each was used to measure how far the distance had been to previous offences. The median distance was used as the overall sample was non-normally distributed (calculated using a Kolmogorov–Smirnov test, $Z = 6.13$, $p < .0001$). For the 899 offences recorded for the 'unique' 104 offenders, no address was recorded for 23 offences (2.6%), a road name was given but not the address (or postcode) for 116 offences (12.9%) (in these cases, the present researcher pin-pointed the middle of the road and obtained the geo-code for this point), the address was referred to a 'near', 'outside', 'opposite', or 'nearby' for 58 offences (6.5%), and a general description of the location (for example, "the bus stop next to the supermarket") was given in four cases (0.4%). For the offenders' address in these cases, 185 had no address or no fixed abode (20.6%) and 23 had a prison ('HMP') address (2.6%)[10]. Overall, this meant that 224 (24.9%) distances could not be calculated, leaving the sample size for *Distance to previous offences* as 655 (including those offenders whose addresses could not be established).

For the *Mean inter-point distance between previous offences*, the distance between all pairs of all offenders' previous offences was calculated and the mean inter-point distance was calculated (this is a measure of dispersal often used in spatial mobility research; the larger the distance, the more spread out offences are. See Goodwill & Alison, 2005 for an example). The mean, mean inter-point distances was used to measure dispersal because the overall sample was normally distributed (calculated using a Kolmogorov–Smirnov test, $Z = 1.21$, $p = .11$). Mean inter-point distances (MID) could only be calculated for offenders who had committed two or more offences on CRIS (excluding the 'original' stranger rape offence). This meant that MIDs could be calculated for 84 offenders. This meant that there were 144 pairs of crimes for which the distance between them could be measured.

The *Offence history* variables were derived from searching for each of the offenders' offence history on CRIS (process outline below), noting the offence for which the offender was charged (from the fixed format fields of the CRIS reports) and recoding this category according to Home Office Counting Rules (with an extra category of Motoring offences)

[10] This does not included instances where the offender committed an offence in the prison itself. For these cases, the offender's address and the offence address were given as the prison.

(Home Office, 2010). As most[11] of these variables were derived from the fixed format fields of the CRIS reports, reliability tests were not carried out.

3.2.3 Analysis

Only appropriate descriptive analysis was carried out within this chapter. Therefore, frequencies, percentages, suitable measures of central tendency, standard deviations and ranges are given for the variables outlined above.

3.3 Results

3.3.1 Timing of offences

The rapes were more likely to occur at the weekend, with the highest frequency of offences occurring on a Saturday (23.2%, *n* = 26), and then on a Sunday (17.9%, *n* = 20). The lowest frequency of cases occurred on a Friday (4.5%, *n* = 5), which is surprising. Other studies show that the majority of stranger rapes occur on a Friday-Saturday (for example, 53% in Ruperal, 2004). However, it is thought that this is because the majority of rapes occur in the early hours of Saturday (that is, from midnight onwards). This could be thought of as Friday night, but technically, it is Saturday morning.

The stranger rapes usually occurred at night[12] except on a Tuesday when the proportion of offences committed during the day were equal to the proportion of offences committed at night (50.0%, *n* = 56). Examining the times of day further, as Table 3.3.1 shows, the majority of rapes occurred in the latter part of the night time, with nearly two-thirds of all of the offences occurring between 2300 and 0559 (66.1%, *n* = 74). The lowest percentage of offences was committed between 0600 and 1359 (5.4%, *n* = 6).

The most frequent specific time of the week that the rapes occurred was in the evening and night of a Saturday (18.8%, *n* = 21 and 23.2%, *n* = 26 respectively).

[11] The address of the Initial approach location was derived from the victim statements or other details of the CRIS report (as explained presently). It was not possible to double-check the accuracy of the address of initial approach because no other researcher was permitted access to this information. Therefore, the Distance to Initial approach location may be seen as 'less accurate' than the other distance measurements and the limitations of using this measurement are noted.

[12] Night is defined as being between 18.00 and 05.59

Table 3.3.1: Percentage of stranger rape offences by time of day (*N* = 112)

Time of day	Percentage
2300-0559	66.1
1800-2259	17.9
1400-1759	9.8
0600-1359	5.4

The present results are concurrent with most research considering the timing of offences. Lea, Lanvers, and Shaw (2003), for example, found that most rape offences were recorded for Saturday and Sunday and Feist et al., (2007) discovered that 54% of rape 'crimed' offences (detected and undetected) were recorded over Friday, Saturday and Sunday (*N* = 593). Studies examining the different victim-offender relationships and the timing offences found similar results; Ruperal (2004), for example, found that 53% of stranger rapes occurred (36% of *N* = 'over 5000') between Friday and Saturday.

In terms of the time of day the offences occurred, Feist et al., (2007, p.16) report how "three in ten of all assaults began between midnight and 00:59." Ruperal (2004) reports how all rape types mostly occur between 9pm and 4am. No real distinction is made between the timing of acquaintance or intimate rapes with stranger rapes, although Ruperal (2004) does suggest that the former types of rape tend to have another, small peak at lunchtimes.

3.3.2 Victim characteristics

One hundred and fourteen victims were involved in the 112 rapes.

3.3.2.1 Age

The mean victim age was 26.4 years old, with a standard deviation of 13.99. The median age was 22, with the youngest victim being aged 13 and the eldest being aged 75. The present study suggests that younger people are more at risk from sexual victimisation from reported stranger rapes than older people; the highest frequency of victims (28.1%, *n* = 25) fell into the 21-25 age category; nearly two thirds were 25 or under (65.8%, *n* = 75) and over three-quarters were 30 or under (77.2%, *n* = 88). This is similar to samples using other recorded data sources (for example, Feist, et al., 2007; MPS, 2006; Ruperal, 2004). Findings from the above UK studies suggest that victims of rape are more likely to be young, usually under 30. Ruperal (2004), for example, found that one third of victims were under the age of 21, whilst one sixth of female victims were under the age of 16. Overall, the mean age of the

sample was 26 years. This mean age is echoed in the results from both the North and South Sexual Assault Referral Centres (SARCs) (McLean & Balding, 2003; Kerr et al., 2003), although these studies examine rapes of children as well as adults (age ranges from 3-93 and 11 to 66 respectively). Results from the British Crime Survey showed that even younger female victims (16-19 years old) were more at risk of a sexual assault than those aged between 20 and 24 (Myhill &Allen, 2004).

Results from studies carried out in the USA are similar; Riggs et al., (2000) found that the mean age of victims presenting to an urban trauma centre, between the years of 1992 and 1995, was 25, whilst Sugar et al., (2003) found a slightly older mean age of victims of 29.3. However, the Sugar et al., (2003) paper only considered victims who were aged over 15, as opposed to the Riggs et al., (2000) study which examined victims of all ages. The former study reported that almost half of all victims (N = 819) were aged between 15-25 years old.

3.3.2.2 Ethnicity

The ethnic appearance of the victims was reported as being 70.2% 'White European' (n = 80). This is in line with the London population distribution of 71% white (Census, 2001). Victims were classified as Afro-Caribbean in 18.4% of offences (n = 21), compared with the population figure of 12% Black Asian victims made up 4.4% of the sample (n = 5), compared with the population figure of 4%. Other victim ethnicities made up 8.2% of the sample (n = 10); Census (2001) found that 4% of the London population could be classified as 'Other.' The over-representation of Afro-Caribbean victims in the sample is one which has been found in other studies, including Smith's (1989) study of rape in Lambeth and Islington. Here, Smith found that Black victims were over-represented by 20%. Similarly, Ruperal (2004, p.2) found that black women were "more at risk than white or Asian women."

3.3.3 Offender characteristics

For the 112 offences, 131 offenders had been arrested. Therefore, for 13 offences, there was more than one offender; in eight cases, there were two offenders; in four cases, there were three offenders; in one case, there were five offenders.

3.3.3.1 Age

The mean offender age within this study was 24.69 years, with a standard deviation of 8.19. The median age was 23 years. The youngest offender was 14 years old, and the eldest 48. The highest frequency of offenders (32.8%, n = 43) fell into the 16-20 years category;

over half were 25 years or less (58.0%, *n* = 76) and under three-quarters were aged 30 years or under (72.5%, *n* = 95). In general, offenders seem to be slightly younger than victims. Generally, however, the age of rapists is found to be young; Amir (1971), for example, suggests that the average age of offenders is 23 years with the highest frequency of offenders aged between 15-19 and 20-24. More recent studies, however, suggest that the average ages of offender could be slightly higher; Ruperal (2004) records an average age of detected rapists in London as 30 years, where most offenders were falling into the 26-30 age group. However, this study examined all types of victim-offender relationship and there is some evidence to suggest that offenders who commit crimes against strangers are younger. Muir and McLeod (2003) found that the majority of offenders who were 19 years or under had committed crimes against strangers (17.4% of all 'under 19' year olds).

3.3.3.2 Ethnicity

The ethnic appearance of the offenders was reported as being 58.8% (*n* = 77) Afro-Caribbean. This is not in line with the London population distribution of 12% Black (Census, 2001) and echoes the findings of other descriptive studies which reflect how Black men are over-represented in offender samples (for example, Smith, 1989). Muir and McLeod (2003) report how there was a significant difference between victim-offender relationship and ethnicity, with more Afro-Caribbean offenders being reported as committing the stranger rapes. However, as Ruperal (2004) notes, findings such as this do "not mean that black males are more prone to commit rape nationally, because of the greater ethnic diversity of the capital compared to other parts of the country" (p. 2).

19.1% of offenders (*n* = 25) were classified as White European, compared with the population figure of 71.1% White; an under-representation. Dark European offenders made up 12.2% (*n* = 16) of the offenders. It is difficult to compare this with the Census data; this category may be included in the White category or the Other category. Asian offenders made up 6.1% (*n* = 8) of the sample, compared with the population figure of 4%, showing a slight over-representation. There were no Oriental offenders in the sample.

3.3.3.3 Distance travelled from home base

A descriptive analysis of the distances travelled to the offences from the offenders' base revealed that, in general, 'journey to crime' was often short. For the 112 offences (rather than for each offender) the mean distance travelled to the Initial approach location was 5.02 km (*SD* = 6.07 km), with a median distance of 2.58 km. The mean distance travelled to the

Crime location was slightly shorter at 4.68 km (*SD* = 6.05 km), with a median of 2.13 km. For both Initial approach and Crime location, the range of distances was 0 km to 31.04 km, suggesting there was some variability in the distances travelled to commit the crimes.

Comparing these results to past research, these seem similar. Empirical studies generally find that rapists, like other offenders, do not travel very far to commit crimes. In UK samples of stranger rape offences, the distance measured from the home base to the crime location has usually been found to be less than 3 km. Canter and Larkin (1993), for example, found that a sample of serial rapists travelled a mean distance of 2.46 km to commit their crimes; whilst Davies and Dale (1995) found that 79 serial stranger rapists travelled a median distance of 2.9 km from their base to approach site. Similar distances have been measured in the USA; serial and non-serial rapists have been recorded as travelling mean distances of between 1.85 km (Rhodes & Conly, 1981) and 5.63 km (LeBeau, 1987a).

3.3.4 Offender and victim characteristics

3.3.4.1 Age

When comparing offender and victim age ranges across the whole of the 112 stranger rape sample, it was found that in 46.4% of cases (*n* = 52), the offender was within an older age category than the victim. In 33% of cases (*n* = 37), the offender was in a younger age bracket than the victim, whilst in 20.5% of cases (*n* = 23), the offender and victim were within the same age category. Please see Appendices Five and Six for the Victim and Offender Age categories.

There is some contention about the relationship between victim and offender age, with some studies reporting that as the offender gets older, the victim gets younger (for example, Gebhard, Gagnon, Pomeroy, Christensen, 1965; Goodwill & Alison, 2007) and others reporting that as offenders get older, the victims get older (for example, Feist et al., 2007; Lea et al., 2003).

3.3.4.2 Ethnicity

Within a third of the stranger rape offences (33.3%) the offenders raped victims who were within the same ethnic appearance group as themselves. This is analogous to past research that suggests offenders will attack victims of the same ethnic appearance as themselves (Muir & McLeod, 2003). However, such studies cite higher percentages[13] and

[13] 96% of Afro-Caribbean women were raped by offender with the same ethnicity as them (Smith, 1989).

those intra-racial attacks are particularly the case with offenders committing rape against those known to them (for example, Smith, 1989). Perhaps then offenders committing rape against strangers are less likely to offend within the same ethnic group.

For all offender ethnic appearance categories, the offender was more likely to offend against a White victim. One hundred per cent of Asian offenders raped a White victim (*n* = 5), compared with 86.7% of Dark European offenders (*n* = 13), 80% of Oriental offenders (*n* = 4), 76.0% of White offenders (*n* = 19) and 61.3% of Afro-Caribbean offenders (*n* = 38).

3.3.5 Offenders' previous offence history

3.3.5.1 Number of offences

One hundred and four offenders out of the 124 'one-off'[14] offenders (82.5%) within the sample had at least one previous arrest and charge on CRIS, had committed 899 previous offences between them. The number of offences ranged from one recorded offence to 96 offences. The mean number of offences recorded was 8.64 (*SD* = 14.33), whilst the median number was four offences.

As Figure 3.3.5.1 shows, as the number of offences increased, the percentage of offenders within the sample decreased, although there were a few more prolific offenders who had 10 or more offences recorded on CRIS. The highest frequency of offenders fell into the 10 crimes or more category (23.1%, *n* = 24). This was followed by 18.3% (*n* = 19) who had one offence in their background, then 16.3 (*n* = 17) who had two, and 11.5% (*n* = 12) who had three. Just over half the offenders had four or less offences (51.9%, *n* = 54).

[14] Out of the 131 offenders who had committed offences in the Stranger Rape offences sample, there were five offenders who had committed more than one offence. Therefore, there were 124 'unique' offenders within the sample. . There were 104 offenders who had a previous offence recorded on CRIS.

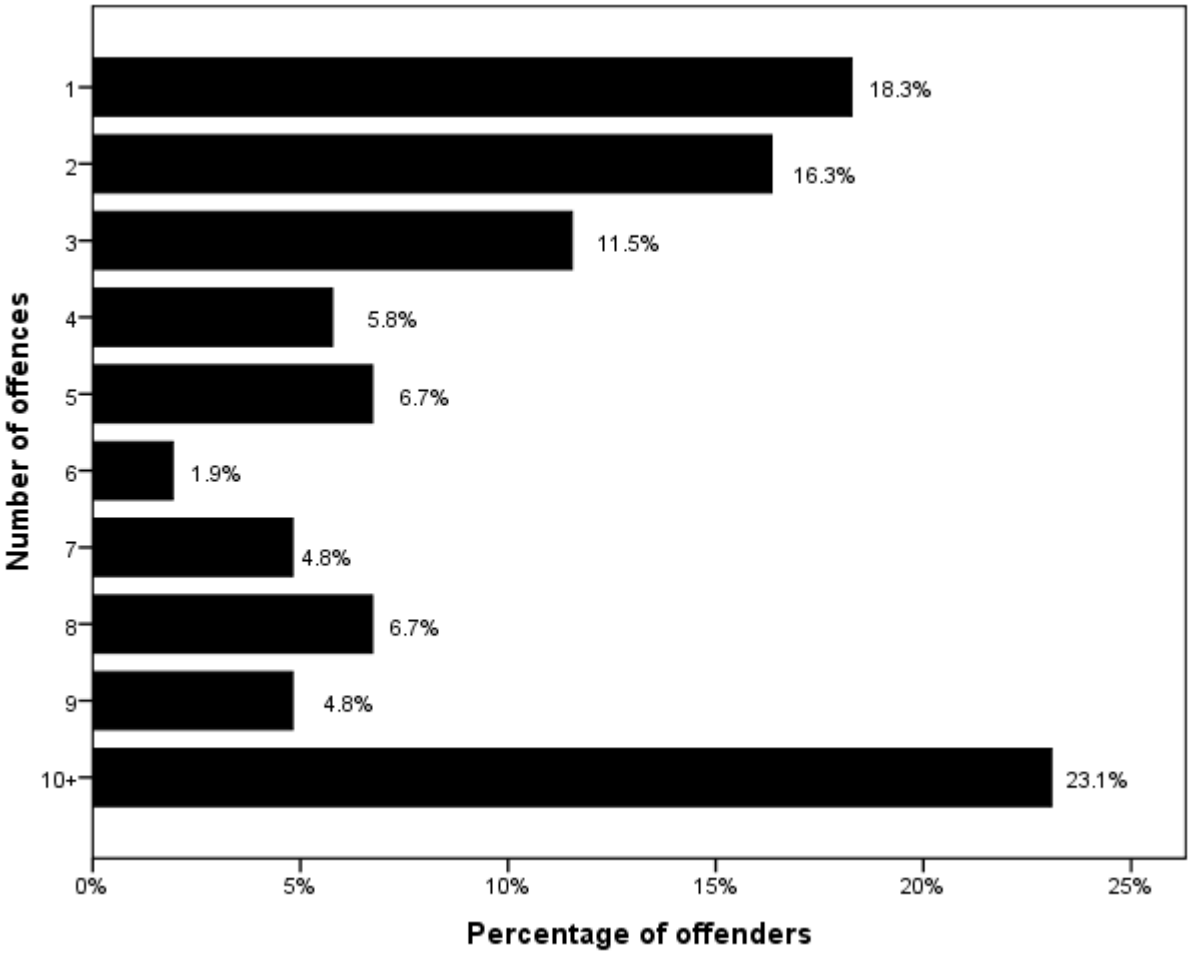


Figure 3.3.5.1: Number of offences per offender

3.3.5.2 Timing of offences

The offences within the offenders' previous history were fairly evenly spread out over the months of the year; the highest frequency was found in July (9.5%, *n* = 85) and the lowest in April (7.1%, *n* = 64). The higher frequency in July may reflect similar patterns of crime 'peaks' often seen across most crime types in the summer months (Hird &Ruperal, 2007). The offences were also evenly distributed throughout the week, with the highest frequency of offences occurring on a Wednesday (19.9%, *n* = 152) and the lowest frequency of offences falling on a Sunday (11.6%, *n* = 104).

3.3.5.3 Types of offences

Previous offences were categorised as being one of 10 types of offences; *Burglary, Criminal damage, Drugs, Fraud, Motoring, Other, Robbery, Sexual, Theft and handling* and

Violent offences.

Table 3.3.5.3a shows the most frequent types of offence within the sample (*N* = 899). Offenders had committed *Violent offences* most frequently (23.3%, *n* = 209), then *Burglary* offences (22.4%, *n* = 201) and *Theft and handling offences* (19.6%, *n* = 176). Less frequent offence types included those that could be categorised as *Other* (0.7%, *n* = 6), *Fraud* (1.2%, *n* = 11) and *Motoring* offences (1.6%, *n* = 14).

Table 3.3.5.3a: Percentage of offences by offence type

Offence type	Number of offences	Percentage of all offences (*N* = 899)
Violence	209	23.2
Burglary	201	22.4
Theft and handling	176	19.6
Robbery	101	11.2
Drugs	77	8.6
Criminal damage	58	6.5
Sexual	46	5.1
Motoring	14	1.6
Fraud	11	1.2
Other	6	0.7

Table 3.3.5.3b shows the percentage of offences by offender.

Table 3.3.5.3b Percentage of offences by offender

Offence type	Number of offenders	Only those with a previous offence on CRIS (*n* = 104)
Violence	76	73.1
Theft	56	53.8
Robbery	41	39.4
Drugs	41	39.4
Sexual	37	35.6
Burglary	36	34.6
Criminal damage	29	27.9
Fraud	9	8.7
Other	6	5.8
Motoring	4	3.8

Out of all of the offenders who had a previous offence recorded on CRIS, 73.1% (*n* = 76) had a previous *Violent offence*. Over half of the offenders (53.8%, *n* = 56) had at least one *Theft and handling offence* on CRIS and 39.4% (*n* = 41) had at least one *Robbery* or *Drugs offence*. Fewer offenders had a previous history of *Fraud offences* (7.1%, *n* = 9), *Other offences* (4.8%, *n* = 6) and *Motoring offences* (3.2%, *n* = 4).

Little research has been conducted using the arrest (rather than conviction) history of stranger rape offences. However, when comparing these frequencies to the conviction data of those convicted of carrying out a serious sexual assault in the UK, there are some similarities. Soothill, Francis, Ackerley, and Fligelstone (2002) found the highest percentage of convictions within a sample of 678 offenders was for theft and handling offences (73%) with 49.9% of offenders having been convicted of violent offences. However, the percentages between these two studies are very different. The present results have a higher percentage of violent offences (73.1% as opposed to 49.9%). Perhaps this is due to the nature of the sample; perhaps it is more difficult to convict offenders for violent crimes or perhaps offenders are cautioned for more minor acts of violence (such as affray). The lower percentage of theft and handling offences for the present offenders, as compared with the Soothill study (53.8%

compared with 73%) , may represent the fact that some theft offences (such as the theft of a motor vehicle) are more likely to be detected and thus, a conviction made (Tilley & Burrows, 2005).

Another difference between the present study and Soothill et al., (2002) is that offenders are not as likely to have a burglary offence (that is, compared with other offences), in this sample (34.6% as opposed to 53.1%). This also could be due to the more favourable 'clear-up' rate of burglary offences (Tilley & Burrows, 2005) and thus, the convicted offenders may be more likely to have been convicted of burglary.

Within the offence history sample, the percentage of offenders with a robbery offence (39.4%) is considerably higher than that of the convicted offenders (17.4%). This may be due to the notion that it is sometimes quite difficult to apprehend and secure the conviction of such a 'quick contact' offence (Smith, 2003). This may also be the case for different levels of sexual offences seen within the present sample as opposed to the Soothill study (35.6% and 7.2%). The attrition rate, especially between the investigative and trial stage, for sexual offences is high (Kelly, Lovett, & Regan, 2005). The percentage of offenders with drugs offences within their history is also higher than the convicted sample (32.5% as opposed to 6.8%). The police may be more willing to deal with offences such as possession by means of a caution, rather than a conviction.

3.3.5.4 Offender age at first offence

The mean age of the offenders, at their first offence, was 20.70 years (*SD* = 8.02), with a median age of 18. The youngest offender was first recorded on CRIS at 8 years, the oldest was 39 years. As expected, for their last offence, the mean age was slightly higher at 23.51 (*SD* = 8.08), with a median age of 22. Here, the youngest offender was 11, the eldest 47.

When the ages at first offence were divided into intervals (See Appendix Six), almost a third (30.8%, *n* = 32) were aged 15 years younger at their first recorded offence on CRIS. Another high proportion of offenders fell into the 16-20 year category (29.8%, *n* = 31). There were 15.4% (*n* = 16) that were aged between 21 and 25 at their first offence. Therefore, over three quarters of the sample were aged 25 or less at their first offence.

3.3.5.5 Previous spatial behaviour

The overall median of all *Distances to previous offences* for all crime types was calculated. The mean *Distance to previous offences* for all offenders was 3.16 km (*SD* = 3.87 km). The median distance was 2.36 km, with a range from 0 km to 31.57 km. Table 3.3.5.5a shows the mean and median *Distances to previous offences* for each crime type including the spread of distances.

Table 3.3.5.5a: Distances travelled to previous offences (in km) (*N* = 655)

Offence	*n*	Median	Mean (*SD*)	Min – Max
Motoring	13	3.63	4.18 (2.79)	0.17-9.40
Burglary	103	2.97	3.34 (2.83)	0-14.22
Theft	145	2.32	3.34 (3.52)	0-18.71
Drugs	68	2.01	2.82 (3.82)	0-19.32
Robbery	77	1.91	3.08 (3.83)	0-21.44
Sexual	31	1.36	2.38 (3.46)	0-14.22
Criminal damage	46	1.08	2.42 (3.14)	0-14.09
Violent	161	1.06	2.75 (3.98)	0-21.47
Fraud	10	1.00	1.34 (1.30)	0.07-4.23
Other	1	0.08	1.11 (1.86)	0.00-3.26

As this shows, the median *Distance to previous offences* was highest for *Motoring offences* (3.63 km), then *Burglary offences* (2.97 km), *Theft offences* (2.32 km) and then *Drugs offences* (2.01 km). Thus within these types of offences, the offenders 'travelled' further to the crime location. Median distances that were measured as less than 2 km included those for *Robbery offences* (1.91 km), *Sexual offences* (1.36 km), *Criminal damage offences* (1.08), *Violent offences* (1.06 km), *Fraud offences* (1 km) and *Other offences* (0.08 km). In general, these findings support previous studies who have found that those committing offences against property travel further than those who commit offences against the person (for example, Rhodes & Conly, 1981).

Table 3.3.5.5b shows the *Mean inter-point distances between previous offences.* The mean *Mean-inter point distance* was 4.40 km (*SD* = 3.91km). The median inter-point distance was 3.51 km, with a range from 0 km to 27.20 km.

Table 3.3.5.5b: Mean inter-point distances travelled between previous offences (*N* = 114)

Offence	*n*	Mean (*SD*)	Median	Min – Max
Other	1	7.34 (0.00)	7.34	7.34-7.34
Sexual	7	5.90 (4.92)	5.83	1.94-7.92
Criminal damage	11	5.37 (6.70)	4.83	0.00-23.79
Violent	39	5.33 (4.97)	4.53	0.00-21.91
Theft	32	4.51 (4.03)	3.59	0.45-15.20
Robbery	23	4.25 (4.14)	3.14	0.06-14.79
Fraud	2	3.12 (0.03)	3.12	3.10-3.15
Drugs	17	3.88 (3.49)	2.35	0.10-13.75
Motoring	2	2.30 (0.67)	2.30	1.82-2.77
Burglary	10	2.50 (1.70)	1.76	0.18-4.80

The largest mean, *Mean inter-point distance between previous offences* was found for Other offences (7.34 km), then for *Sexual offences* (5.90 km), *Criminal damage offences* (5.37 km), and *Violent offences* (5.33 km). Those offences that had mean, *Mean inter-point distance between previous offences* of less than 5 km were for *Theft offences* (4.51 km), *Robbery offences* (4.25 km), *Fraud offences* (3.12 km), *Drugs offences* (3.88 km), *Motoring offences* (2.30 km), and *Burglary offences* (2.50 km). Overall, it seemed that offenders were committing property crimes within shorter distances to each other, whilst when, they were committing crimes against the person, they were spreading their offences out wider. This has been found within Goodwill and Alison (2005) who found that serial rape and murder offences were widely spread, whilst burglary offences seemed to be more closely dispersed in space.

3.4 Chapter summary

This chapter provided a descriptive analysis of the nature of the stranger rape sample, paying particular attention to the timing of offences, the victim and offender background characteristics. The main findings of this chapter were that, in general, most offences occurred either on a Saturday or a Sunday, and usually at night time, between 2300 and 0559. Victims were usually aged below 30, and were (aged between 21 and 25 years). Most victims could be classified as ‘White’ but there was an over-representation of Afro-Caribbean victims (compared with Census, 2001 figures). Offenders were also found mostly to be under 30

years old, with the highest frequency of offenders within the 16-20 age bracket. Most offenders could be classified as Afro-Caribbean, but again, this was an over-representation. Comparing victim and offender characteristics, in the majority of cases, the offender was in an older age category than the victim.

Most of the offenders had a previous offence recorded on the MPS system, with the number of offences ranging from one to 96, with a median number of four offences. These offences most often occurred in July, on a Wednesday. Out of these offences, most were Violent, Burglary or Theft offences, whilst only just over 5.1% were for previous Sexual offences. In terms of the offenders, nearly three quarters of those with a previous offence on CRIS had a Violent offence in their history, over 50% had a Theft or handling offence, and over a third had previous offences for Robbery and for Drugs offences. A third of all offenders also had a previous Sexual offence within their history. Usually, offenders were young adults when they were first recorded on CRIS, with a median age of 18. When considering the median distances the offenders travelled to previous offences, these were also relatively short, at less than 3 kilometres. These distances were also further for property offences, compared with offences against the person. Finally, offenders who had more than two previous offences in their history tended to have a mean inter-point distance between previous offences of less than 5 km, and these offences were more widely dispersed geographically if the offences were committed against people, rather than property.

The results found within this chapter support the findings from other studies. Rapes usually occur at the weekend (Lea et al., 2003; Feist et al., 2007) and at night time (Ruperal, 2004). Victims are usually young (for example, Ruperal, 2004) and Afro-Caribbean victims are usually over-represented within rape samples (Smith, 1989). Similarly, offenders are usually young (Amir, 1971) and Afro-Caribbean offenders are also over-represented in previous samples (for example, Ruperal, 2004). Some studies have also found that offenders are generally older than their victims (for example, Feist et al., 2007) and that offenders will usually target victims within their own ethnic group (Muir & McLeod, 2003). Journey to crime research has also noted that, in general, offenders do not travel far to commit offences (for example, Canter & Larkin, 1993). Studies examining the offence history of offenders have found that usually offenders will have a criminal record and that often this will not be for a sex offence; Smallbone, Wheaton and Hourigan (2003), for example, found that over two-thirds of rapists studied had previous convictions for other non-sexual offences. The findings presented here also support the literature that suggests that some sex offenders are likely to have a lifestyle or have qualities that are disruptive, reckless or impulsive (Rice,

Harris, & Quinsey, 1990), with tendency for illicit substance abuse (Looman, Abracen, DiFazio, & Maillet, 2004) and a history of delinquent behaviour (Davis & Leitenberg, 1987).

When considering the offenders' previous arrest history, there were differences in the percentage of categories of offences in comparison with the Soothill et al., (2002) study. It is thought that this may be due to the previous offences within this study being arrest records rather than conviction records and the nature of the crime in London (as opposed to the UK as a whole). The offenders' previous spatial offending behaviour is also congruent with past research; notably finding that the offenders travelled further to offend for property offences, as opposed to crimes against the person (for example, Rhodes & Conly, 1981). Lastly, the present study echoed the findings from Goodwill and Alison (2005), who found that crimes against the person were more widely dispersed in space than those against the property.

The findings of the present study have important implications for both theory and practice. In terms of theory, the offenders within the present sample seem to be travelling close distances from home to rape in either their stranger rape offences or their past offending behaviour. Equally, distances between previous offences are relatively short. This is a finding that is congruent with ideas derived from the environment criminology literature. Thus, offenders may be using their 'awareness space' (Brantingham & Brantingham, 1981) as a basis of their offending behaviour, using knowledge from their everyday movements (C/F Routine activity Theory, Cohen & Felson, 1979) to inform their decisions of where to offend. Offending close to home (but not too close) has its benefits (C/F Rational Choice Theory, Cornish & Clarke, 1986), including a reduced effort (C/F the Least Effort Principle, Zipf, 1949). Secondly, the offenders within the sample are generally 'versatile' offenders. They tend to offend, but they do not necessarily commit sex crimes only. Thus developmental theories that usually apply to criminals, in general, may apply to stranger rapists, such as a history of an unstable family (Gomes-Schwartz, 1984), a "physically punitive father" (McCord, McCord, & Verden, 1962, p.169), low socio-economic conditions, experience of neighbourhood violence and interaction with delinquent peer groups especially in 'middle childhood' (10-13 year olds) (Ingoldsby & Shaw, 2002).

The findings from this chapter also have important implications for intelligence-gathering at a localised level. The various characteristics of the offenders who have committed these rapes can lead to the development of an intelligence profile[15] of the 'typical' stranger rapist. Such information can be used to inform operations. Suspects can be

[15] Not an offender profile

prioritised in terms of their background characteristics; the finding that most offenders will be on CRIS already makes the use of crime records not only important in terms of recording crimes and evidence collection, but also highlights the importance of using CRIS as an operational resource. Secondly, knowing when stranger rapes most often occur and to whom, may also inform preventative measures, such as public awareness. Lastly, knowledge about inter-crime proximity, especially in terms of differentiating between different types of offence, has implications for case linkage. As Chapter One has discussed, examining inter-crime distances across a series of linked offences can lead to the development of optimum models for prediction of case linkage.

The findings of this chapter do, however, have their limitations. Firstly, the use of police data to build a picture of the nature of stranger rape has well-documented disadvantages (see Chapter Two and the Introduction of this chapter for a review). Secondly, this chapter summarises the results from a sample of detected crimes; findings from a sample of undetected crimes could look very different. This is especially pertinent in terms of offender background characteristics; offenders who 'get away' with raping victims without getting caught may have different characteristics. The reason why the offenders within these offences were caught may have been because they were already on CRIS. Thirdly, the information gained about the characteristics of these stranger rape perpetrators may not be enough to discriminate between these offenders and others. Generally, offenders tend to be young, travel short distances to offences and usually have a criminal background. Thus, when prioritising suspects, the police or crime analysts may not be able to reduce the pool by very much.

In summary, however, the present chapter gives an overview of the types of setting, victims and offenders who are involved within rapes in this thesis. Subsequent chapters examine specific details of the spatial and offence behaviour exhibited within the rape events.

CHAPTER FOUR
GEO-MOBILITY STYLES

This chapter presents a model of the offenders' spatial behaviour within the 112 stranger rapes. Previous research has generally focused upon journey-to-crime distances and aspects of the offence, offender, victim or environment that may give rise to variations in offenders' spatial behaviour. Until recently (Beauregard, Proulx, Rossmo, & Leclerc, 2007), there has been a lack of research evidencing the mobility of offenders *within* the offences, especially patterning movements between one or more locations. These recent studies have centred on examining the accounts of incarcerated serial sex offenders, producing models that are applicable to those offending against acquaintances and strangers, as well as against adults and children. Equally, these models have been based upon previous models (that is Rossmo, 1997) that have not been empirically tested (van der Kemp & van Koppen, 2001). Moreover, previous research (Beauregard et al., 2007b) has examined particular types of spatial behaviour by using analysis techniques that may not fully explore the qualitative inter-relationships between geographical and behavioural variables. A different method, thematic analysis, may provide a more accurate picture of the spatial behaviour of rapists in context (Joffe & Yardley, 2004). The present chapter, therefore, examines the spatial nature of the offences within the *Stranger rape sample* (*N* = 112) by, 1) giving an account of the distribution of offences within London, the number and types of locations used, any movement between locations, and the distance travelled within offences, and 2) using inductive thematic analysis (Glaser & Strauss, 1969) in the manner presented within Braun and Clarke (2006) to draw out the main themes relating to the offenders' *within* offence mobility. Descriptive results showed that offences were more densely concentrated around the centre of London and most offences involved one location. The offenders usually approached and attacked their victims in the street, whilst they usually committed the rape and released the victim indoors her own house. The majority of offenders travelled on foot and the distance travelled within the offence was usually short, if at all. The thematic analysis identified four main *Geo-Mobility Styles*; *Intruded*, *Ambushed*, *Abducted* and *Followed*. These styles are explained in terms of theoretical models of offenders' spatial behaviour and target selection choices and the implications for operational and strategic policing are discussed.

4.1 Introduction

The following section gives an overview of previous findings regarding the location type and the spatial mobility of offenders. It goes on to discuss the need for models of spatial mobility within offences to enable a more dynamic description of the impact context may have on offenders' offence behaviour.

4.1.1 Distribution of offences

In their Crime Pattern Theory, Brantingham and Brantingham (1981) proposed that crimes are not randomly distributed in space. Instead, they proposed that the distribution of offences depends on the opportunities that occur within the environment, the routine activities and awareness spaces of offenders. Further, Cohen and Felson (1979) emphasised that crimes occurred when a motivated offender, a suitable target or victim come together, without the presence of a capable guardian.

At a macro level, the distribution of offences often reflects the socio-economics of the area and the structure of the city. White (1932) and Boggs (1965), for example, found that higher rates of offences are often linked to proximity to the Central Business District of a city and population levels. The centre of a city may provide a greater amount of potential victims and offenders who may come together in an environment that may be conducive to crime (for example, poverty, and lack of community or anonymity).

Brantingham and Brantingham (1981, p. 48) point out that crime often occurs within the centre of the city, especially if the city is older, where it has developed outwards from a central core. More recent research has found evidence for this; when studying the distribution of all types of rape in the Metropolitan Police Service district, Ruperal (2004) found that they had more frequently occurred within the centre of London. Moreover, she found that the frequency of offences decreased as the distance from the centre of London increased, with fewer offences occurring on its outskirts. Ruperal (2004, p.3) believed this to be due to "higher levels of social interaction" in more central areas (Ruperal, 2004, p.3).

4.1.2 Number of locations and mobility within offences

Research into the number of locations within rapes and whether there is mobility within rapes is limited. However, LeBeau (1987b) measured the number of scenes within rape offences, comparing Open (undetected), Single (one-off) and Serial offenders. He found that all three sets of offenders could use up to five scenes and that 34.8% of the Single

offenders (*N* = 233) used two scenes, 31.3% used three, 21.9% used four and 12% used five. LeBeau (1987b) also reported that 50% of stranger single offences (*N* = 80) involved the offender moving the victim. In terms of distance travelled within the offences, LeBeau (1987a) found that, when offenders were strangers to their victims, they travelled further with them than if they were not.

4.1.3 Transportation used

Again, there is a paucity of research that examines the method of transportation used within stranger rapes. Some studies recognise that offenders do use different kinds of transport (as opposed to just travelling on foot) and that this has an impact on journey-to-crime distances. LeBeau (1987a), for example, found that when a rapist used a vehicle to travel to crime, journey to crime distances were longer compared with those offenders who had not. Van Koppen and Jansen (1998) also found this to be the case within robbery offences; Snook (2004) found similar results when considering journey to crime distances of serial burglars within a city in Canada. He found that offenders who used a car travelled a significantly further distance than those who used different methods of transport. Within this study, Snook (2004) also found that the majority of offenders (85%, *N* = 347) walked to the offence site, whilst 47% used a vehicle, 3% a bicycle, 2% used another method of transport, and 5% used a combination of walking and travelling on a bicycle.

Snook, Cullen, Mokros and Harbort (2005) considered journey to crime distances of 53 German serial murderers and also found that those travelling in a car had greater journey to crime distances than those who did not. Here, the most frequent method of transportation used within these offences was a car (34%, *N* = 247), whilst walking was the second most common method used (23.9%). Other modes of transport within the Snook et al., (2005) study were public transportation, bicycle, taxi, motorcycle, moped or combinations of these different methods. The methods of transportation used within offences varies therefore, which could be a product of the layout and size of different geographical locations, the type of crime the offenders were committing, and/or offender characteristics (for example, age) (Snook, 2004).

4.1.4 Type of locations

Beauregard, Proulx, Rossmo, Leclerc, and Allaire (2007b, p.1073) note that there are often four location sites within a sexual offence. These are a) the encounter site, where the offender initially approaches or comes into contact with the victim b) the attack site, where

the offender first attacks the victim c) the crime site, where the offender commits or attempts to commit the sex offence and d) the victim-release site, where the offender releases or leaves the victim. Beauregard et al., (2007b) also note that these locations can be all in the same place or can occur at different sites. Research into the types of location offenders choose to approach, attack, rape and release their victims is detailed in this section. It must be noted, however, that most sex offence studies have only noted the types of initial approach and crime locations and do not record the type of attack or victim release locations.

By applying the principles of Routine Activity Theory (Cohen & Felson, 1979) and Crime Pattern Theory (notably, awareness spaces, Brantingham & Brantingham, 1981), it could be suggested that offenders may initially approach victims in areas that are familiar to them and in areas within which they usually travel, work or socialise. This could mean that offenders would initially approach victims in busy areas, such as public places or along pathways, such as bus or train routes. Equally, the application of RAT could mean that offenders choose to seek out victims in areas where there is no capable guardian (for example, isolated areas).

Interview and descriptive studies with sex offenders provide support for these two different types of approach location. Beauregard, Rossmo, and Proulx (2007a), for example, found that rapists often approached and selected victims in public places. By interviewing 69 incarcerated serial sex offenders, the researchers found that most of the offenders (57%) described how they used 'local visibility' (the area within which they lived and were familiar with) to search for particular victims. These included public places such as bars and parks which the offender would usually frequent. The offenders explained how this was an "easy way to find attractive targets, to gain access to them, and to estimate their vulnerability" (Beauregard et al., 2007a, p.453). Empirical research into all types of victim-offender relationship rapes (that is, stranger, acquaintance, intimate and so on) has supported the notion that victims are often approached in public places. LeBeau (1987b) found that both serial and one-off rapists in the USA often approached victims in an outdoor public location, or an indoor public or semi-public locations such as a public building, a party or a bar. A more recent UK based study (Feist et al., 2007) also found that the location of the initial approach was more likely to be in a public place (23%).

When researchers consider the association between victim-offender relationship and type of location, some studies have found that the initial approach location is more likely to be in a public place in stranger offences than it is in offences committed by known offenders. Feist et al., (2007), for example, found that the initial contact point for stranger rapes was in a

public place in 66% of cases compared with 34% within acquaintance rapes, 11% within rapes committed by a friend, 8% by a partner or ex-partner, 3% by a parent or other relative and 7% by someone who has an 'other' relationship with the victim (N = 548). Similarly, Ruperal (2004) found that initial approach location was an element that differentiated between stranger and non-stranger rapes, finding that 54% of victims within stranger rapes were approached in an outdoor location compared with 17% of acquaintance rapes (stranger rapes accounted for 36% whilst acquaintance rapes accounted for 37% of 'over 5000' rapes). Ruperal (2004) believes that "the relationship between the victim and suspect is linked to initial approach" (p.3). Davies and Dale (1995) also found that stranger rapists often located victims in busy areas, with higher numbers of potential victims, such as entertainment areas, bus stops or train stations.

Equally, other offenders selected isolated areas as hunting grounds for potential victims. Beauregard et al., (2007a, p.454) found that geographical isolation was one of the most important factors that the sex offenders considered when selecting their victims. One offender related how "she was there, all alone and no one was around." Sometimes, this initial approach location is outdoors; in others, the offender will approach the victim within her own home. Feist et al., (2007) recount how offenders would force entry into the victim's home in 4% of cases (N = 558). Rossmo (2000), however, found that the initial approach location within a sample of serial homicides was the victim's home within 30.9% of cases. Similarly, Beauregard et al., (2007a) found that 22% of victims within their sample were at home when the serial sex offender initially approached them. Variations in these percentages may relate to the type of offence considered within these offences; Feist et al., (2007) was examining 'one-off' incidences of rape, whilst Rossmo (2000) and Beauregard et al., (2007a) were examining serial offenders.

Ideas from Rational Choice Theory (Cornish & Clarke, 1986) might also seek to explain why offenders choose particular locations to initially encounter their victims. Offenders may weigh up the costs (risks) and benefits (success) of encountering a victim within a specific location. In terms of breaking into a victim's house, this might prove to be of high risk to the offender; as Rossmo (2000, p124) states "As an offender moves from the street to an apartment building parking lot, to indoors the building itself, and to the interior of an individual apartment, he is progressively entering more private space and concomitantly increasing his risk" (cited from Beauregard et al., 2007a, p.454). Although attacking and raping the victim within such an isolated space may be less risky (see below), the act of breaking into the victim's house will evidently pose a high risk in itself. In terms of the initial

approach location being an isolated outdoor location, the chances of being interrupted by a witness may be lower than if the location was less isolated. Indeed, approaching the victim in a public place may mean that there is a greater chance of being seen by witnesses, the victim realising she is being approached and raising the alarm or evading the attack.

In terms of the attack location (where the offender uses force or threat of force to overpower the victim), previous descriptive studies have not often noted the location where the offender attacked the victim. Instead they seem to record the location where the victim initially encountered the victim and where the actual rape took place. Beauregard et al., (2007a), however, describe the choices serial sex offenders made when selecting a location within which to attack their victim. They found that 35% of their sample ($N = 69$) selected a location specifically for its physical characteristics, for example, because it was secluded (woods). The attack location and the initial approach location may be the same, and thus, the arguments outlined above are relevant. It could also be argued that the attack location may even be random; Beauregard et al., (2007b) point out that some offenders attack their victims whenever and wherever they can before the victim has a chance to escape.

Past research has found differing results in terms of crime locations. Some studies find the majority of recorded stranger rapes take place outdoors (Bownes, O'Gorman, & Sayers, 1991), whilst Jones, Wynn, Kroeze, Dunnuck, and Rossman (2004) find that the rapes tended to occur more often in the victim's own home (43%) than outdoors (23%) ($N = 238$). Jones et al., (2004), for example, found that 17% of their victims were raped within their assailant's house, whilst Feist et al., (2007) found that 26% of offences occurred within this location. The latter study, however, did not differentiate between different types of victim-offender relationships when considering locations and, therefore, this figure might be biased towards those offences committed by a known perpetrator.

Some studies emphasise the location of a car being more prevalent in stranger offences than in those perpetrated by a known offender; Jones et al., (2004), for example, reports a higher percentage than that of the present study. This study was a comparison of stranger and non-stranger assaults reported by victims within a community-based medical centre in Michigan, USA over a 40 month period. The main aim of the study was to examine whether physical violence and coercion, injury and trauma were associated with the victim-offender relationship. They found that 21% of offenders committed the rape within a car, compared with 3.6% within this data set. However, this may be due to cultural differences and may be just a product of the use of transportation or area size within Michigan compared with London.

Victim release location is, again, not always measured within descriptive studies. However, Beauregard et al., (2007a, p.459) report how 79% of offenders within their sample left the victim where they had raped them, whilst 9% of offenders left their victim in a busy location so that they could be "helped and taken home."

Other factors have been seen to be related to the type of locations, for example the age of the victim. Feist et al., (2007) relate how victims over the age of 16 are more likely to be attacked in their own homes (around 30%) than whilst victims under 16 tend to be attacked in the offenders' home or where they both live. This would make sense as victims under the age of 16 are thought to be more likely to be raped by a relative or a friend.

4.1.5 Models of offender's spatial behaviour

Derived from ideas about journey-to-crime, domocentricity and target selection choices, there have been various models outlining how offenders can be differentiated by their spatial behaviour both to crime and, more recently, within crime. These are outlined within this section.

4.1.5.1 Commuter versus marauder

By studying a sample of 45 serial rape offenders, Canter and Larkin (1993) found that it was possible to model serial offenders' spatial behaviour in two ways. Firstly, they defined 'Commuters' as offenders who purposefully make trips to offend outdoors of the area within which they live, rather like how a business person would commute to work. Secondly, they defined 'Marauders' as offenders who commit crimes within the areas they live. In geometrical terms, a marauder is defined as someone who commits crimes within an area circumscribed by the distance between the two offences that are the furthest away from each other. This is also known as the 'Circle hypothesis.'

Canter and Larkin (1993) argue that offenders have two 'ranges' within which they operate. Firstly, they have a home range; an area within which they live, and carry out their non-criminal activities. Secondly, they have a criminal range; an area within which they carry out their criminal offences. The researchers state that, within the Commuter type, there is no overlap between the offenders' home and criminal range; they will travel out from the boundaries of their home range to commit crimes in different areas, their criminal range. Within the Marauder type, however, the home range and the criminal range will overlap considerably. Thus the offender will travel to areas within which he knows and commits his

non-criminal activities, to commit his criminal activities. This area will be a safe enough distance from his base however (C/F Turner, 1969; Brantingham & Brantingham, 1981).

A number of studies have found that offenders' spatial behaviour can be modelled using this approach. These studies have been carried out using serial offenders from across the world, from Tokyo (Tamura & Suzuki, 2000) to the U.S.A (Warren, Reboussin, Hazelwood, Cummings, Gibbs, Trumbetta, 1998). Although the severity and type of crimes committed have differed, ranging from rape to arson, the majority of these studies have found that the highest proportion of offenders fall into the marauder category. However, there is some evidence that commuters could make up the highest percentage of offenders in some samples, especially within serial burglary cases (Meaney, 2004).

Although this model provides a useful distinction regarding how the offender may travel to crime, there have been some criticisms of this typology. Alston (1994), for example, states that the model fails to account for offenders who commit offences very near to their home base and also that it does not account for how influential other 'anchors' (for example, work place, family or friends' houses) can be on offenders' spatial behaviour. Also, the model's practical utility can be called in to question. If the offender is unknown, the police will not be able to distinguish whether he or she is a Marauder or a Commuter, thus rendering any hypotheses about the location of the offender's base impossible to test (van der Kemp & van Koppen, 2001).

Beauregard et al., (2007b) also argue that such a typology (alongside other spatial models of serial, sexual homicide perpetrators) can be criticised for failing to incorporate offenders' offence behaviour and, therefore, ignoring the potential relationship between geographical elements in the offence and offence behaviours. They also argue that such models do not consider how offenders' behaviour may change throughout the offence and, therefore be more dynamic or fluid rather than stable. As argued in Chapter One, this is a criticism levelled at studies that consider offence behaviour to be stable across situations; to improve the accuracy of tasks such as offender profiling and case linkage, the impact of context on the exhibition of offence behaviours must be considered (Alison et al., 2010).

4.1.5.2 Rossmo's model

Rossmo (1997) proposed a model of the hunting processes of serial offenders. According to Beauregard et al., (2005, p.594), this model was "based on geography of crime theory, empirical data, and investigative experience" and developed from observations of serial homicide offenders. Rossmo (1997) argued that offenders would adopt either one of

four victim search methods. The Hunter is the offender who searches for victims within their own city or neighbourhood. The offender sets out on his journey with premeditation to commit a crime and operates from his own home base. The area within which he searches is influenced by his awareness space and routine activities. The Poacher is an offender who searches for victims outside his own city or neighbourhood. Again, these offences are planned but, this time, the offender operates from another base, such as another city or a friend's house. The Troller, on the other hand, operates from his own home base, within his own awareness space and is guided by his routine activities. However, in a different vein from the Hunter and the Poacher, the Troller will act in an opportunist manner and will attack victims accordingly. Finally, the Trapper differs from the other three styles, in so much as this offender will operate within his own home and, in planned attacks, will ensure victims come to him.

Rossmo's (1997) model also takes into consideration the methods of attack that the offender will adopt when encountering his victim. The Raptor will attack the victim immediately after coming across him or her; the Stalker will encounter a victim, will follow him or her and attack when there is an opportunity to do so; the Ambusher will attack victims when they come into contact with him, in a location that he bears a significant amount of control over (for example, his own home). Overall, serial offenders can adopt different combinations of the victim selection and method of approach strategies.

As with the Marauder and Commuter model, Rossmo's (1997) model provides useful ideas about the offender's spatial behaviour and attack methods. Further, Rossmo's model provides an insight about how other anchor points may influence offenders' spatial behaviour as well as examining ideas about how opportunity and planning may moderate this behaviour. Beauregard et al., (2007b) also argue that Rossmo's (1997) model considers both geographical elements of the offence (for example location type) as well as offence behaviour (for example method of approach), a shortfall in other models. They continue to argue that Rossmo's (1997) model also provides a more fluid, contextually based account of the spatial behaviour within offences.

However, as argued previously, it is difficult to apply Rossmo's model to the spatial behaviour of an unknown offender (van der Kemp & van Koppen, 2001). This knowledge is only useful to the police if they know the particular hunting process of the offender, and thus they can make inferences about his or her home base (or other anchor points). Beauregard et al., (2005) summarise how the different models of sex offenders' spatial behaviour can be related to specific offence characteristics. However, if the police do not know what type of

category the offender fits into, this information cannot be utilised. Van der Kemp and van Koppen (2001) also argue that Rossmo's model has not been empirically validated and, thus, it's generalisability for different types of offences or within different localised areas or countries remains in question. Both Canter and Larkin (1993) and Rossmo (1997) also examine the spatial behaviour of serial offenders; as Chapter One argues, there has been evidence to suggest that relatively few offenders go on to commit the same kind of offence (see Simon, 1997 for a discussion). The spatial behaviour of 'one-off' or more versatile offenders may be very different from serial offenders. Rossmo's model also explains the behaviour of both stranger and non-stranger offences, with victims being both adults and children. Further investigation is needed to understand whether these issues are important in determining offender's spatial behaviour to and within offences. Further, Beauregard et al., (2007b) argue that Rossmo's model also does not include important information about the offence, such as strategies for contacting the victim and the offenders' travel methods. Rossmo's model (1997) also does not consider the types of locations within which offenders are approaching, attacking, raping (or committing another kind of crimes) and releasing their victims (or disposing of their bodies).

4.1.5.3 Beauregard, Proulx, Rossmo, Leclerc, and Allaire (2007)

In a response to the shortfalls of Canter and Larkin (1993) and Rossmo (1997)'s models, Beauregard et al., (2007) examined how geographical and behavioural elements within sex offences combined. By interviewing 72 serial sex offenders, who had committed 361 crimes between them, the researchers developed a model that sought to explain both spatial and offence behaviour. Their model was deeply embedded within the Rational Choice Theory framework and involved careful and in depth consideration of the choices the offender's made from the initial hunting process, to the initial approach, to the attack, offence and victim release location. From interviewing the sex offenders, Beauregard et al., (2007a) derived various behavioural and geographical variables. The behavioural variables were; victim alone, kidnap-style attack, strategies for contacting the victim (seduction, gifts, games, tricks, giving drugs/alcohol, direct action, threats, physical violence), strategies for bringing the victim to the crime site (as before), strategies for committing the crime (as before), hunting field (familial, occupational, local visibility, prostitution market, ambush, internet, love-lines, advertisements), victim search methods (Hunter, Poacher, Troller, Trapper), and attack methods (Raptor, Stalker, Ambusher). The geographical variables identified were; encounter site (indoor private, indoor semi-public, indoor public, outdoor private, outdoor

semi-public, outdoor public), attack site (as before), victim-release site (as before), crime location (location last seen, encounter site, attack site, offence site), encounter-site familiarity (not familiar, familiar to offender, familiar to victim, familiar to both victim and offender), attack-site familiarity (as before), crime-site familiarity (as before), victim release site familiarity (as before), crime-location set (which combinations of the different locations were used and if there was any movement between them).

Beauregard et al., (2007b) adopted multiple correspondence analysis and cluster analysis using the various geographical and behavioural variables to identify six rape 'tracks.' The first script is the Outdoor rape track (A) which was found in 22.2% of the crimes. Here, the offender adopts the Hunter victim search method and the Raptor method of approach. He usually ambushes or performs a direct attack on victims who are on their own. The offender's approach will involve violence or threats of violence. The entire offence will occur outdoors, with the initial approach location and the attack location being one and the same. The offender then moves the victim from the attack location to a different location (kidnap-style attack), and the victim release location could also be a different location. Beauregard et al., (2007) state that, in terms of familiarity of the crime locations, the encounter and attack locations will be familiar to both the victim and the offender; the crime site will probably be unfamiliar to both and the victim release site may or may not be familiar to the offender. The second rape script was found to be the Outdoor rape track (B), found in a small percentage of cases (3.6%). This track differs from the first in the fact that the initial approach location is indoors, in a public place. The offenders take their victims to the crime location using physical violence and release the victim in an outdoor private location. Again, the victim selection technique is Hunter, and the method of approach is Raptor. Again, the offender abducts the victim.

The third rape track is the Home-Intrusion track, found in 11.9% of cases. Here the offender encounters, attacks, commits the crime and releases the victim in one location, usually the victim's home. Similar to the first two tracks, the offender adopts the Hunter victim selection technique and the Raptor style of approach. Physical violence is also used.

The fourth rape track identified in Beauregard et al., (2007b) is the Direct action rape track (in 11.9% of cases). Here, the offence locations are usually all in the same place (indoor public). Within these cases, the offender is said not to adopt any hunting strategy but "act directly to approach, bring the victim to the crime site, and commit the crime" (Beauregard et al., 2007b, p.1076). The fifth rape track is the Sophistication rape track which was found in 26.9% of the offences. Within this, offenders adopt the victim selection strategy of Troller

and opportunistically search for victims through their occupation or search for victims within the prostitution market. They ambush the victims by using tricks or seduction techniques to get the victims to come to them, after initially approaching the victim in a public place. The crime site is a location familiar to the offender (for example, their own house) and the offender will usually release the victim in an outdoor location which may be where he had approached the victim in the first instance.

Lastly, the Family-Infiltrator track was found in 16.3% of cases. The offender usually adopts a Trapper style victim selection technique, alongside an Ambush approach method. They will be able to access victims through their work or by infiltrating the victim's family. Within this track, all crime locations will be the same and will usually be familiar to the offender. The strategies for getting the victim to these locations were usually found to be with gifts or with alcohol or drugs.

Having identified these six clusters of behaviours, the researchers then grouped particular tracks into scripts. Such scripts "represent the complete sequence of instrumental decisions and actions prior to, during, and following the criminal act" (Beauregard et al., 2007b, p.1071). The first script is the Coercive script and comprises of the Outdoors tracks (A and B) and the Home-Intrusion script. Beauregard et al., (2007b) have grouped these together, seemingly because the offenders all use the same victim selection and method of approach strategy. The second script identified is the Manipulative script which contains the Sophisticated and Family Infiltrator scripts. These scripts share the characteristic of the offender being manipulative in order to gain access to the victim (for example, gifts, seduction, deceiving a family). The third and final script identified is the Non-persuasive script. This only contains the Direct Action track and is said to represent a spontaneous, opportunistic attack.

Beauregard et al., (2007b)'s model underlines the importance of examining how geographic and offence behaviours interact and influence each other and examines the spatial behaviour *within* offences, an under-researched area. Such studies are crucial in moving forward our understanding of how contextual features can affect offence behaviour (Alison et al., 2010), which in turn has direct implications for examining how useful particular behaviours are in establishing consistency and predictive accuracy for both offender profiling and case linkage. The model also provides an insight into the decision-making strategies and cost-benefit analysis serial sex offender make when carrying out their offences. Such information may be beneficial for crime prevention strategies, clinical rehabilitative work for offenders and risk assessment. This work extended and set the framework for the valuable

interview studies carried out by Beauregard and colleagues in their various decision-making studies (Beauregard et al., 2007a; Beauregard et al., 2007c).

However, there are several limitations to the model presented by Beauregard et al., (2007). Firstly, the method of analysis used within the paper examines inter-relationships between mutually exclusive, categorical variables. This only allows for a particular combination of actions to occur. Thus, the framework is somewhat rigid and does not allow for different, novel combinations of behaviours to be observed in new samples. For example, if an offender uses a Troller victim selection method but does not search for victims through their occupation or the prostitution market, it is not clear within which track this offender is likely to sit. Using a quantitative method to relate such a complex set of circumstances, with a large amount of potential combinations, somewhat simplifies a dynamic inter-personal event.

The model's applicability for use within police investigations is also limited. As with the limitations of the previous models such as Canter and Larkin (1993), information about the offender's victim selection methods, or familiarity of the different crime sites is not known when investigating a rape by an unknown offender. The starting point of knowledge is only when the offender first encounters the victim. Therefore, a model that examines the spatial mobility of the offence from this point onwards may be needed for it to be truly useful in operational policing.

The model also draws on the victim selection and method of approach strategies drawn up by Rossmo (1997). As previously stated, it has been questioned whether Rossmo's model has been empirically validated (van der Kemp & van Koppen, 2001). Equally, Beauregard et al., (2007b)'s models have been derived from samples of serial sex offenders who commit offences against known and stranger victims, who can be adults or children. Therefore, the applicability of applying this model to 'one-off' offenders who commit rapes against adult victims can be questioned. This is also the case because of the selection criteria for the Beauregard et al., (2007b) study. The researchers interviewed incarcerated offenders from Canada. This may mean that the offenders represent a particular type of group of offenders and therefore, the findings of the study may not be relevant to offenders who have been identified through recorded police data from the United Kingdom.

The use of the particular behavioural variables used within Beauregard et al., (2007b) may also be questioned. There seems to be an overlap in the variables used; for example, the Raptor approach involves the offender immediately attacking the victim on approach, whilst the direct action is explained as being a strategy for contacting the victim or for taking him or her to another location. It is also unclear as to the difference between direct action and

physical violence. Also, the authors do not make it clear how they derived the scripts from the rape tracks. For example, they group together Outdoor rape track A, B and the Home-Intrusion track, seemingly because they all involve the same victim selection and method of approach tactics. It is not clear why these should be defining features of the offences and this grouping seems arbitrary, especially as the authors go on to state that the Home-Intrusion track "is clearly different" (Beauregard et al., 2007b, p.1079).

The Beauregard et al., (2007b) model also omits relevant information. There is no explanation of the methods of transportation used within the particular rape tracks, nor is there any assessment of how far the offenders travel within their offences. Equally, as Chapter Six will argue, there is no detailed examination of the specific behaviours exhibited within the offence (for example, types of threat, disclosure of personal information, specific sexual acts performed); rather the behavioural variables within this study are more general such as 'direct action' or 'seduction.'

Lastly, Beauregard et al., (2007b) uses a sample drawn from serial offenders. The study was based on 361 offences, carried out by 72 serial sex offenders. The numbers of offences for each offender ranged from two to 37 offences. Therefore, the spatial behaviour of these prolific offenders may greatly influence the results of the study, this limiting the generalisability of the findings.

4.1.6 Rationale and research questions

This chapter aims to examine both static elements (for example, type of location) and dynamic elements of the offenders' spatial behaviour (mobility within offences). It is argued that an examination of the distribution and types of locations used within rape offences will contribute to the localised, intelligence-gathering processes within Sapphire Command. The within-crime mobility will be examined in response for the need to examine the impact context has on the exhibition of crime behaviours (for example, Mokros & Alison, 2002) (this will be explored within Chapter Six). Previous examinations of spatial behaviour have examined offenders' decision-making processes when choosing to initially approach, attack, commit crimes and release victims in particular locations (for example, Beauregard et al., 2007a). Police investigating a rape committed by an unknown offender do not have this information. Previous models of spatial mobility within crimes have not been empirically tested (for example, Rossmo, 1997; from van der Kemp & van Koppen, 2001) nor have they been based on elements of such theories (Beauregard et al., 2007b). Moreover, the Beauregard et al., (2007b) study utilises a method that may not fully explore the dynamic

nature of spatial behaviour and is based on data drawn from an incarcerated, serial sex offending population. It is therefore argued that a model of offenders' spatial mobility drawn from police records is needed. This model would examine the mobility within the offenders' crimes using qualitative methodology (that is, thematic analysis) which is systematic but yet fully explores the spatial behaviour within context. In summary, therefore, this chapter aims to:

- Describe the distribution, types and number of locations within the rapes
- Examine the transportation used by the offender as well as the distances travelled within the offence
- Explore the inter-relationships between the variables above by using thematic analysis to draw out the types of spatial behaviour (or 'geo-mobility') exhibited within the offences.

4.2 Method

4.2.1 Sample

The 112 victim statements derived from the 112 records of Stranger Rape recorded on the Metropolitan Police Service's Crime Recording Information System (CRIS) were used within this chapter. These offences were committed between May 2004 and December 2006 and had been committed by 131 offenders against 114 victims. Data recording issues (as described in Chapter Two) meant that the length of the victim statements varied. For some offences, there was more than one account of the offence by the victim; for example, this could include a statement taken when the victim came into initial contact with a police officer, an initial interview with Sexual Offence Investigation Techniques Trained Officer (SOIT), and transcripts from the Achieving Best Evidence (ABE) interview (a video-taped interview). In other cases, only the initial interview was recorded in on the CRIS record. The drawbacks of this as a source of data for analysis have previously been discussed. However, the 112 victim statements remain the main source of information for the thematic analysis carried out within this chapter.

If there were any discrepancies found in cases where there was more than one version of events, the researcher (and coders used in the inter-reliability analysis, see below) used the last version of the offence recorded. This method was chosen as this version was likely to be the most detailed, or the account for which clarification had been sought from interviewing officer.

The 114 victims' ages ranged from 13 to 75 (*M* = 26.4 years, *SD* = 14.0 years); over three-quarters of the victims were aged 30 or under (77.2%). According to the Metropolitan Police Service's ethnic appearance codes, 70.2% of victims were described as 'White European', 18.4% Afro-Caribbean, 4.4% Asian and 8.2% were described as 'Other.'

4.2.2 Procedure

4.2.2.1 Descriptive account

The distribution of offences was measured by examining the Borough Operational Command Unit (or BOCU) within which the rape had occurred. As stated previously, there are 32 of these within the Metropolitan Police Service and, when a crime is recorded, the BOCU where it had occurred is noted. Therefore, extracting this information was a simple task, and could be recorded straight from each CRIS record.

The other variables used within the first half of this chapter are outlined in Appendix Seven. Please note that there were four possible locations that could be used for any given offence. The first was the *Initial approach location*, where the offender initially approached the victim and/or when the victim first noticed the offender. Then there was the *Attack location*, where the offender used force, or the threat of force, to overpower the victim. The third possible location was the *Crime location*, where the offender raped or attempted to rape the victim. Lastly, there was the *Victim release location*, where the offender left the victim, allowed the victim to leave or where the victim escaped. These are *Number of locations* (continuous 1-4), *Type of location (specific)* (categorical - *Indoor private: Suspect's house, Victim's house; Indoor semi-public: Bus or train station, Car park, Nightclub, Public toilet, Shop, Stairwell, escalator, lift; Outdoors semi-public: Garden; Outdoors public: Alleyway, footpath, subway, Park, common, open space, cemetery, Street; Private transport: Car; Public transport: Bus or train*), *Transportation* (categorical - *Bicycle, Bus, Car, Foot, Train*), *Distance travelled within offence* (continuous, measured in kilometres), *Location set*[16] (categorical - *IAACVR, IA_ACVR, IA_A_CVR, IA_A_C_VR, IAA_C_VR, IAA_CVR, IAA_C_VR, IAAC_VR*), *Type of location (Public or private)* (categorical - *Indoors private, Indoors semi-public, Outdoors private, Outdoors semi-public, Outdoors public, Private transport, Public transport)* and *Movement* (categorical – *Forced* or *Not forced*).

[16] This describes the locations used and whether there was movement between the locations. Initial approach location = IA; Attack location = A; Crime location = C; Victim release location = VR; Movement is denoted by _. Therefore, IA_ACVR means that there was movement between the Initial approach location and the Attack location but after that, there was no movement and the Attack, Crime and Victim release locations were one and the same.

The *Number of locations, Types of location (Specific location)* and *Transportation* were all derived using content analysis (as described below). The *Distance travelled within offences* was measured by calculating the distance between the *Initial approach location* and the *Crime location*. *Location set, Types of location (Private or public),* and *Movement* were derived as 'codes' from the thematic analysis of the victims' statements (as described below).

Chapter Two identifies the method the present author adopted to locate the address of the initial approach location. Descriptions that helped the researcher identify the initial approach location address included examples such as "Number X bus stop on ADDRESS", or "bus stop by the pub, on ADDRESS", or "Just off the bus stop, near old CAR garage, on the junction with ADDRESS." The researcher was able to use streetmap.co.uk © and Google Earth © to pin point these locations. As the present chapter goes onto explain, some offenders approached the victim and committed the crime in the same location and therefore, the initial approach location address will be the same as that recorded as the crime location by the MPS.

Chapter Two also identifies the way in which some of the crime addresses are often not recorded precisely, mainly because the offence happened in a park or outdoors a particular location. For the 112 offences examined in this chapter, 19 offences (16.96%) were recorded as being 'outdoors' a particular address, 14 offences (12.5%) were recorded as being within a park, common or other open park area, another 14 offences (12.5%) were recorded as occurring 'near' to a particular address, four offences (3.57%) were recorded as occurring 'opposite' an address, and two offences (1.79%) were recorded as happening on a road, without the precise address being recorded. This means that, out of the 112 stranger rapes that occurred, 47.32% of the crime locations could not be precisely pin-pointed. To deal with this, the researcher stripped away the 'near', 'opposite' and 'outdoors' descriptors and used the address given to derive the geo-code. For instances where the offence occurred in a park, unless a more accurate description was given (for example, next to a monument that the researcher could identify on map), the researcher found the geo-code for the very centre of the park or open space. For the two offences that occurred on a 'road', the researcher also took the geo-code from the very centre of those roads. Although this process was not ideal, the researcher was consistent and systematic in her way of dealing with these issues. It was estimated that often, the distances would only be inaccurate by a matter of metres, if at all. There were three offences (2.68%) which the researcher could not pin point an initial location at all. All the crime locations could be identified.

4.2.2.2 Spatial mobility within offences

Each victim statement was examined and extracts relating to the spatial behaviour of the offender within the offence were identified. These were defined as being all sections that pertained to the physical locations described within the offence, any movement of the offender independent of the victim, any movement that the offender forces on the victim and any methods of transportation used within the offence.

These were underlined within the text but were not taken out the main body of the statement so as to preserve contextual background to the narrative (Braun & Clarke, 2006). An example is as follows:

"Victim was walking home from a friend's house; and had entered the alleyway, the suspect was following her. He pushed her to the ground. The suspect made off."

As this chapter goes on to explain, there were four possible locations where the crime could have been committed; the *Initial approach location*, the *Attack location*, *the Crime location* and the *Victim release location*. The police only systematically record the location of the crime and the location of the offender. Therefore, it was up to the present researcher to be able to find the locations of the other locations from the victim statements. On consideration, it was believed that the only other location that could be systematically and feasibly identified from the victim statements was the Initial approach location. Therefore, only the *Initial approach location* and the *Crime location* were used as a basis for the distances measured within this and subsequent chapters. Further investigations could enable the distance travelled to the *Attack* and *Victim release* location to be measured.

4.2.3 Analysis

4.2.3.1 Content and descriptive analysis

For the first part of the chapter, a descriptive analysis of the *Distribution of offences*, the *Number of locations*, *Types of location (Specific location)*, and *Transportation* was carried out. These variables were derived from the content analysis of the 112 victim statements. Content analysis is the way in which "the researcher evaluates the frequency and saliency of particular words or phrases in a body of original text in order to identify key words or repeated ideas" (Namey et al., 2008, p.138). Thus, this method was used to identify the key offence behaviours exhibited by the offenders. As with the thematic analysis outlined in later within this chapter, the content analysis carried out by within this chapter was 'data driven' (Glaser & Strauss, 1967). The researcher read and re-read the victim statements,

making notes about the behaviours exhibited within the statements before the content analysis was conducted (as suggested in Namey et al., 2008).

Descriptive analysis was also used to examine the Distance travelled to offence location and the variables ('Codes' and 'Sub-codes') that were derived from the thematic analysis (described below).

4.2.3.2 Thematic analysis

For the second part of the chapter, an inductive or 'data-driven' thematic analysis of the spatial aspects of the rapes was carried out (Glaser & Strauss, 1969). It was decided that a data-driven approach would be used in order to be "more flexible and open to discovery of themes or ideas not previously considered" (Namey, Guest, Thairu, & Johnson, 2008, p.139), as opposed to more 'deductive' approach (see Krippendorf, 1980) which is driven by theory. It must be acknowledged that the present author has knowledge of previous studies of this aspect of rape behaviour (for example, Beauregard et al., 2007b) and that "data are not coded in an epistemological vacuum" (Braun & Clarke, 2006, p.84). However, the present author tried to be as 'open-minded' and free of a-priori assumptions as much as possible.

The method of thematic analysis followed the six different 'phases' of this type of examination outlined in Braun and Clarke (2006).

Phase One of this process involved familiarisation of the data. The present author immersed herself in the data, reading and re-reading the various accounts of each rape. This process was intensive; firstly, this was carried out to identify suitable rapes to include within the sample. Secondly, the procedure of extracting the statements from CRIS itself required the researcher to read the full report in order to identify the places within the text where the victim had recounted the rape event (see Chapter Two for further explanation of this). Thirdly, the reports were read again when the researcher anonymised the accounts and again, when the researcher began to identify the verbal and non-verbal behaviours for subsequent content analysis (see Chapter Five). By this time, the researcher had a firm grasp of the narratives of each of the accounts and she began to re-read all 112 to actively identify patterns in the spatial mobility of the offenders within the offences, making notes and recording ideas in a manner akin to Braun and Clarke (2006, p. 87).

Phase Two of the thematic analysis involved generating the initial codes that were appearing in the data. As Braun and Clarke (2006, p.88) cite, codes are "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way

regarding the phenomenon" (Boyatzis, 1998, p.63). For this chapter, the researcher was only coding for elements that related to the movements of the offenders within the offence.

The author printed out all (anonymised) victim statements and manually marked on the text the parts of the accounts that dealt specifically with spatial behaviour. The beginning and end of a section of text which related to the offenders' spatial behaviour was marked with an asterisk (*). In the first instance, this was carried out by writing notes on the marked areas of all the statements. From this, it was clear that several recurring themes were starting to emerge. These were; firstly, that there were often multiple locations within the offences; that these could be identified as being the location where the offender approached the victim, the location where the offender attacked the victim (used force against the victim for the first time), the location where the offender committed the crime (the rape or the attempted rape), the location where the offender released the victim. Secondly, that these locations could all be one and the same or that the offender could use more than one location within the offence. Thirdly, these locations could be indoors or outdoors, and in a public, semi-public or private place. Fourth, movement (if there was any) consisted of the offender forcibly moving the victim from one place to another or the offender following the victim from one place to another. Fifth, that any movement could involve different types of transportation. Table 4.2.3.2a gives an example of a piece of text and the initial coding ideas.

Table 4.2.3.2a: Extracts from a victim statement and the developing codes

Extracts from a victim statement	Developing codes
The victim was in her house. She awoke to find a man in her bedroom who threatened her with a knife. He raped her and left.	1. One location for the whole offence (initial approach, attack, crime and victim release location were one and the same). 2. The locations were all in the victim's house (an indoor private location) 3. There was no movement between locations
The victim noticed that the offender was following her on public transport. The suspect followed her out. The suspect followed her out of the tube; the victim went to her usual bus stop but noticed that the suspect was still standing nearby her. He grabbed her on the street and forced her to another outside public place. He raped her and made off. SUS made off in direction unknown.	1. Three locations for the whole offence (initial approach, attack, crime were different; the victim release location was the same as the crime location). 2. The initial approach location was on public transport 3. The attack location was in an outdoors public place 4. The crime and victim release location was in an outdoors public place 5. Movement between initial approach and attack location was not forced 6. Movement between attack location was forced

After having identified these emergent codes, the researcher printed out all statements again and used different colours of highlighter pens for the different emerging codes (as above). As there was often more than one code for a particular piece of text, notes were written next to the text to explain this. From these notes, the codes and sub-codes were identified. These were given labels and the definitions and are described in Table 4.2.3.2b.

Phase Three involved examining the codes and sub-codes generated in Phase Two into ways in which they combined to "form an overarching theme" (Braun & Clarke, 2006, p.89). The researcher began by arranging and re-arranging the codes and sub-codes into a thematic map (as advised by Braun & Clarke, 2006). This was an iterative process and involved examining the ways in which the various codes and sub-codes were similar to each other and ways in which these differed.

Phase Four of the thematic analysis of the spatial behaviour exhibited within the offences involved the reviewing the themes established in Phase Three (Braun & Clarke, 2006). As Braun and Clarke (2006, p. 91) state, "themes should cohere together meaningfully, while there should be clear and identifiable distinctions between themes."

This was carried out by examining all statements that had been assigned to each of the four themes and assessing whether they were consistent with the theme to which they had been assigned. In some cases, it was thought that the extract should actually be assigned to another theme instead.

Phase Five of the thematic analysis involved the researcher "defining and naming the themes" identified within victim statements (Braun & Clarke, 2006, p.92). Detailed examples of cases within each theme were outlined, "identifying the 'story' that each theme tells" (Braun & Clarke, 2006, p.92). This detailed example-giving is outlined in the Results section of this chapter. The naming of each of themes was decided upon in a way that best described this story. *Phase Five* of the thematic analysis was the production of the results that are outlined below. The inductive thematic analysis resulted in three main codes being identified, with 17 sub-codes. These codes and sub-codes are shown in Table 4.2.3.2b.[17]

[17] Please note that there is some overlap between the types of location identified within the thematic analysis and the content analysis. The types of location here were identified as being in a public or private, indoor or outdoor space. This way of examining the type of location was examined using the thematic analysis method because arbitrarily fitting the types of location identified within the content analysis to whether the types of location were public or private and so on was not an accurate picture of whether these locations were public or private and so on. Only detailed thematic analysis enabled the researcher to better understand the types of location that were committed in the offence. For example, 'garden' could be coded as an outdoor private or an outdoor semi-public place. Thematic analysis allowed the researcher to explore the level of privacy these locations yielded, from the description of it given by the victim.

Table 4.2.3.2b: Codes and sub-codes with definitions

Codes	Sub-code	Definition
A. Location set	1. IAACVR 2. IA_ACVR 3. IA_A_CVR 4. IA_A_C_VR 5. IAA_C_VR 6. IAA_CVR 7. IAA_C_VR 8. IAAC_VR	1. The offender uses one location for the whole offence (he initially approaches, attacks, commits the crime, and releases the victim in the same place). 2. The offender approaches the victim in one location then moves to another location to attack, commit the crime and release the victim 3. The offender approaches the victim in one location, moves to another location to attack her, moves to another location to commit the crime and then releases the victim in the same place as he commits the crime. 4. The offender uses four different locations (he initially approaches, attacks, commits the crime, and releases the victim in different places). 5. The offender initial approaches and attacks the victim in the same place, moves to another location to commit the crime and releases the victim in the same location as he commits the crime. 6. The offender initially approaches and attacks the victim in the same place and then moves to another location to commit the crime and release the victim. 7. The offender initially approaches and attacks the victim in the same place and then moves to another location to commit the crime and to another location to release the victim. 8. The offender initially approaches, attacks and commits the crime in one location and moves to another location to commit the crime.
B. Location Type	1. Inside Private 2. Inside Semi-Public 3. Outside Private 4. Outside Semi-Public 5. Outside Public 6. Private Transport 7. Public Transport	1. An inside place that is privately owned or to where the general public do not have access (the victim or suspect's house or other private residence; a shop or place of work that is closed). 2. An inside place that is privately owned but to where the general public limited access (a public toilet, a communal area such as a lift or stairwell, shop). 3. An outside private place that is privately owned and to where the general public do not have access (a gated back garden, private fields without public throughways). 4. An outside semi-public place that is privately owned but to where the general public have limited access (front garden, driveway). 5. An outside public place where the general public have open access (street, alleyway, park or common). 6. Transport that is owned by a private individual and used by that private individual or named drivers (car, motor-cycle, bicycle) 7. Transport that is owned by public or private companies and is used by the general public (bus, train, tram).
C. Movement	1. Forced 2. Not forced	1. The offender uses force or the threat of force to move the victim to one place to another. 2. The offender does not use force or the threat of force to move the victim from one place to another.

The reliability of the coding of the Codes and Sub-codes are shown in Table 4.2.3.2c. Overall the level of agreement between codes was 'very good' (M = 0.97, SD = 0.08).

Table 4.2.3.2c: The level of agreement for the Codes and Sub-codes

Codes and Sub-codes		Cohen's Kappa	Agreement quality
D. Location set		0.96	Very good
IAACVR			
IA_ACVR			
IA_A_CVR			
IA_A_C_VR			
IAA_C_VR			
IAA_CVR			
IAA_C_VR			
IAAC_VR			
E. Location Type	Initial approach location	1.00	Excellent
Inside Private	Attack location	1.00	Excellent
Inside Semi-Public	Crime location	0.99	Very good
Outside Private	Victim release location	0.99	
Outside Semi-Public			Very good
Outside Public			
Private Transport			
Public Transport			
F. Movement	Initial approach location to	0.78	Good
Forced	Attack location	1.00	Excellent
Not forced	Attack location to Crime location	1.00	Excellent
	Crime location to Victim release location		

4.3 Results

4.3.1 Descriptive analysis

4.3.1.1 Distribution of offences

The offences were distributed throughout the MPS policing region, over most of the 32 Borough Operational Command Units (BOCUs), except for three. Odds ratios[18] of the rates of offences per BOCU were calculated, showing that four BOCU's had a stranger rape rate of 200% more than was expected by chance. Other areas had much lower rates of offending than was expected (less than 20%). The offences were more densely concentrated around the centre of London.

[18] Odds ratios were calculated by dividing the observed rate of offences per BOCU by the population rate per BOCU, from Census (2001).

4.3.1.2 Number of locations

In 46.4% (*n* =52) of cases, the offence occurred over two locations. Within 39.3% (*n* = 44) of cases, the offence occurred within one location; in 13.4% (*n*= 15), there were three locations, and in 0.9% of cases (*n* = 1) the offence occurred over four locations. As Beauregard et al., (2007a) report, most offenders do not tend to move their victim from one location to another. In their study, for 41% of cases (*N* = 69), the victim was not moved, a similar percentage to the current study.

4.3.1.3 Initial approach location

Figure 4.3.1.3 shows the type of locations where the victim was first approached by the offender.

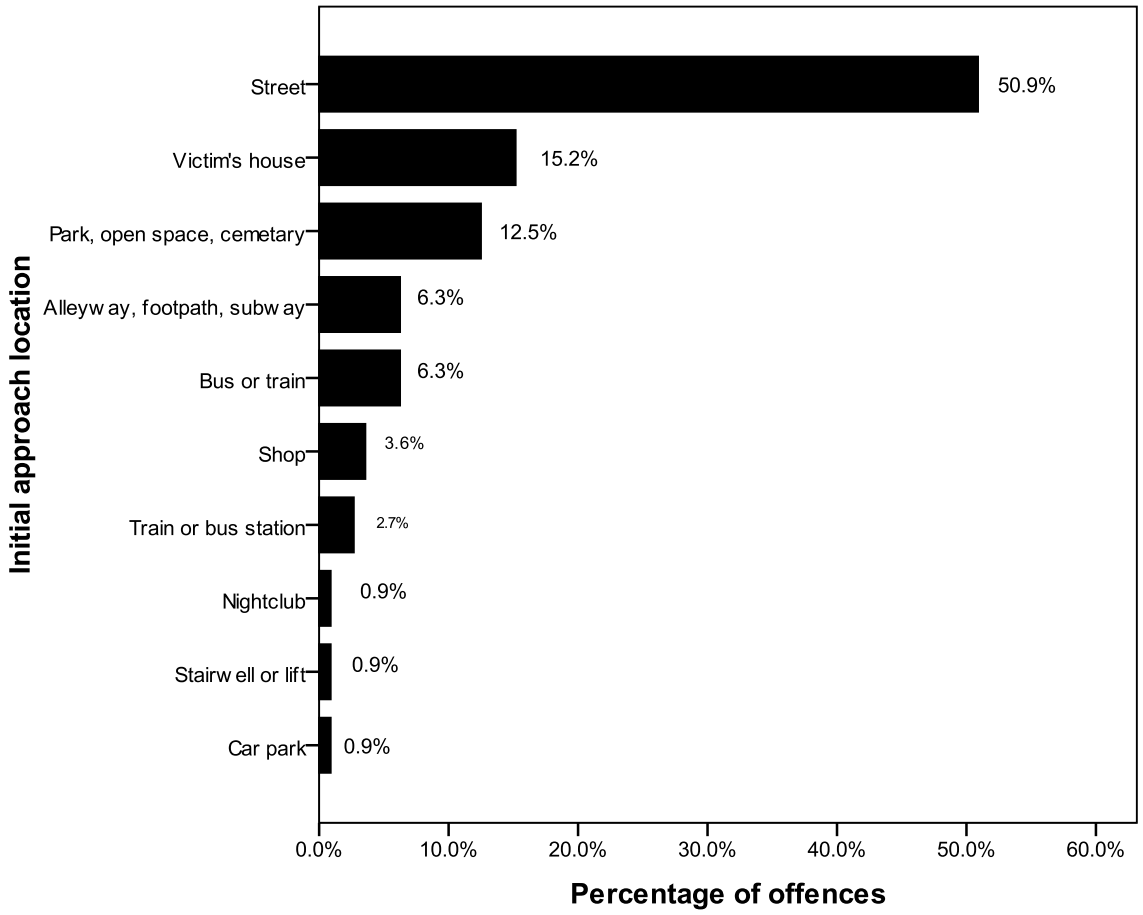


Figure 4.3.1.3 Percentage of types of Initial approach location (*N* = 112)

Within the 112 cases, over half (50.9%, *n* = 57) of the initial approaches were in the *Street*. The next frequent place location was in the *Victim's house* (15.2%, *n* = 17). Within 12.5% (*n* = 14) of cases, the victim would be approached in a *Park, common* or other *open*,

space. The offender approached the victim within an *Alleyway, footpath or subway* in 6.3% of cases (*n* = 7), and on a *Bus or a train* in another 6.3% of cases (*n* = seven). Less frequent locations for the initial approach were in a *Shop* (3.6%, *n* = 4), *Bus or train station* (2.7%, *n* = 3), a *Nightclub* (0.9%, *n* = 1), Stairwell or lift (0.9%, *n* = 1), and an indoor *Car park* (0.9%, *n* = 1).

In relation to previous studies, the finding that most of the approaches were located within a public area, namely a street, is echoed by Feist et al., (2007) who found that the location of the *initial approach* was more likely to be in a public place (23%). However this study considered all types of victim-offender relationships and found that the next, most frequent approach location was the offender and the victim's shared home (18%). The attack was only instigated by forced entry into the victim's home in 4% of the cases (*N* = 558). Therefore, it can be suggested that, within the stranger rape sample, forced entry into a victim's home is more likely than when perpetrated by an acquaintance or an intimate offence. Indeed, Ruperal (2004) believes that "the relationship between the victim and suspect is linked to initial approach" (p.3).

4.3.1.4 Attack location

Figure 4.3.1.4 shows the type of locations where the victim was attacked by the offender.

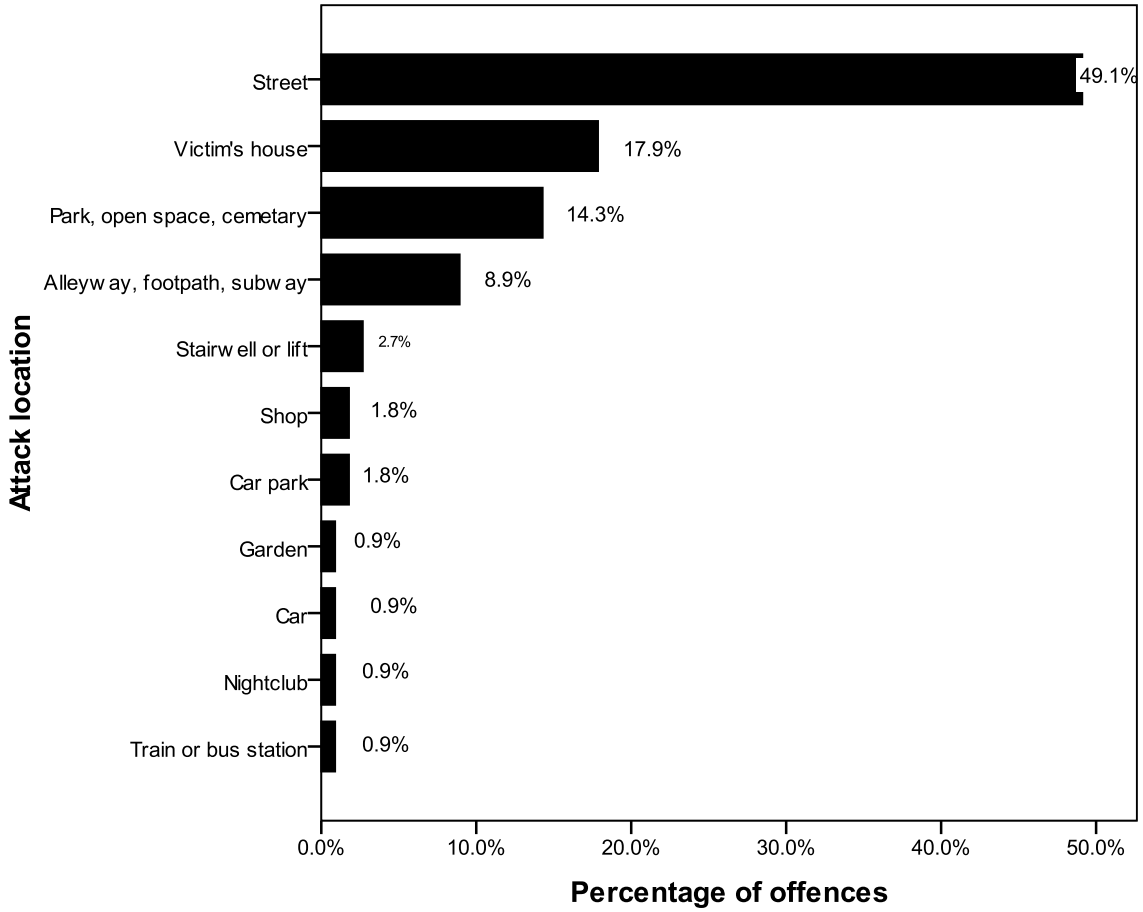


Figure 4.3.1.4 Percentage of types of Attack location (*N* = 112)

Similar to the *Initial approach location*, the most frequent *Attack location* was the *Street* within 49.1% of cases (*n* = 55). The second most frequent location was, again the *Victim's house* in 17.9% (*n* = 20). Both these percentages are slightly higher than in the *Initial approach location*. Again, the third most frequent type of *Attack location* was *Park, common* or other *open, space* (*n* = 16, 14.3%) and then, an *Alleyway, footpath or subway* (*n* = 10, 8.9%). These slightly higher percentages seem to suggest that some offenders may have been waiting for the location to be a little more isolated before they attacked their victims. Less frequent percentages of *Attack location* included a *Stairwell or lift* (2.7%, *n* = 3), a *Car park* (1.8%, *n* = 2), a *Shop* (1.8%, *n* = 2), a *Car* (0.9%, *n* = 1), a *Garden* (0.9%, *n* = 1), a *Nightclub* (0.9%, *n* = 1) and a *Bus or train station* (0.9%, *n* = 1). The *Attack location* is not often examined within descriptive studies.

4.3.1.5 Crime location

Not all offenders raped their victims in the same location as they attacked them. Indeed, the distribution of the type of *Crime location* differs a little from the *Attack location* within the current sample. Figure 4.3.1.5 shows the type of locations where the rape was committed.

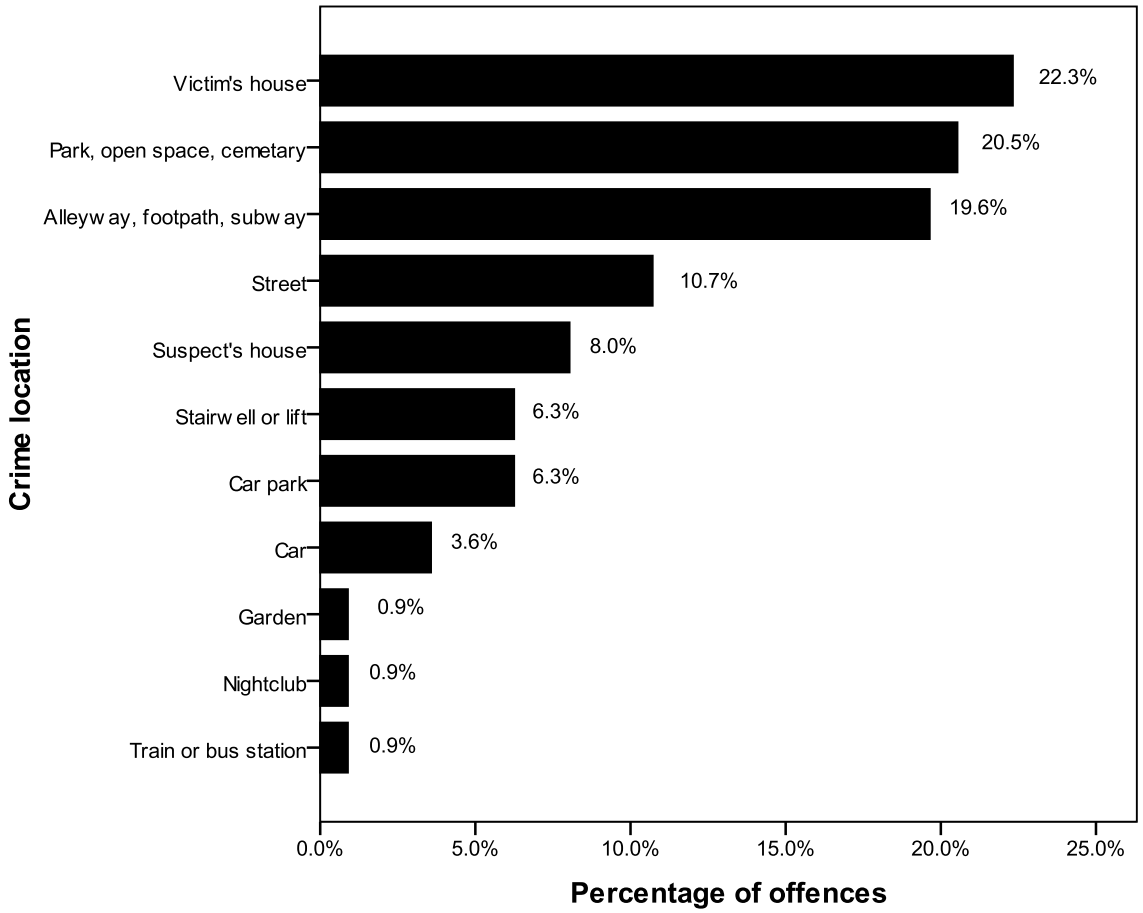


Figure 4.3.1.5: Percentage of types of Crime location (*N* = 112)

The most frequent *Crime location* within the present sample was the *Victim's house* (22.3%, *n* = 25). The next most frequent location was *Park, common* or other *open, space* (*n* = 23, 20.5%), and then *Alleyway, footpath or subway* (*n* = 22, 19.6%). The *Street* was now the fourth most frequent location (*n* = 12, 10.7%), emphasising the idea that the offenders were committing the rape itself in a more secluded area. The *Suspect's house* was a new location and was the next most frequent location found within the sample (8%, *n* = 9). Other less frequent *Crime locations* included a *Car park* (6.3%, *n* = 7), a *Stairwell or lift* (6.3%, *n* =

7), a *Car* (*n* = 4, 3.6%), a *Garden* (0.9%, *n* = 1), a *Nightclub* (0.9%, *n* = 1), and a *Bus or train station* (0.9%, *n* = 1).

Past research has found differing results in terms of attack locations. Some studies find the majority of recorded stranger rape attacks take place outdoors (Bownes, O'Gorman, and Sayers, 1991), whilst Jones et al., (2004) find that the attacks tended to occur more often in the victims' own home (43%) than outdoors (23%) (*N* = 238). In relation to the present study, with similar percentages for the *Victims' house* and a *Park or common*, the findings are similar to both studies. In terms of the attack location being the suspects' house (in the present study, 8%), other studies have found higher percentages. Jones et al., (2004), for example, found that 17% of their victims were raped within their assailant's house, whilst Feist et al., (2007) found that 26% of offences occurred within this location. The latter study, however, did not differentiate between different types of victim-offender relationships when considering locations and, therefore, this figure might be biased towards those offences committed by a known perpetrator.

Some studies emphasise the location of a car being more prevalent in stranger offences than in those perpetrated by a known offender; Jones et al., (2004), for example, reports a higher percentage than that of the present study. They found that 21% of offenders attacked within a car, compared with 3.6% within this data set. However, this may due to cultural differences and may be just a product of the use of transportation or area size within Michigan compared with London. Also, the present study did not consider rapes that occurred by illegal mini-cab drivers. If these cases were included, the percentage of offences where the attack location was a car may have been higher.

4.3.1.6 Victim release location

The type of location where the offender left or released the victim was also measured. Figure 4.3.1.6 shows the type of locations where the victim was released.

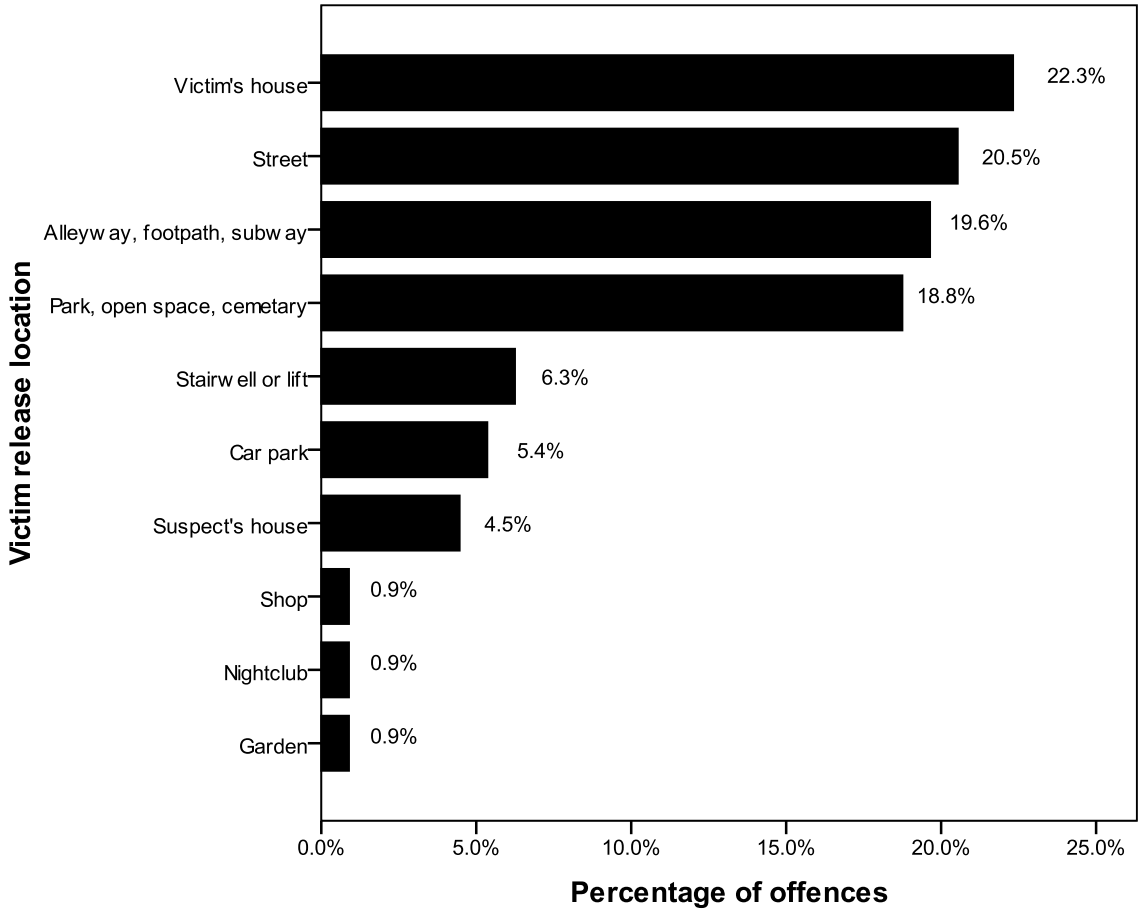


Figure 4.3.1.6 Percentage of types of Victim release location (*N* = 112)

The most frequent *Victim release location* was, again, the *Victim's house* (22.3%, *n* = 25). The next most frequent, however, was the *Street* (20.5%, *n* = 23), a slight change from the *Crime location*. This could mean that the offenders were walking the victim back to a street after raping them. The next most frequent *Victim release location* was *Alleyway, footpath or subway* (19.6%, *n* = 22), the same percentage as the *Crime location*. The fourth most frequent location was *Park, common* or other *open, space* (18.8%, n = 21), with a slightly lower percentage than the *Crime location*. Less frequent percentages for *Victim release location* include *Stairwell or lift* (6.3%, *n* = 7), *Suspect's house* (4.5%, *n* = 5), a *Garden* (0.9%, *n* = 1), a *Nightclub* (0.9%, *n* = 1), and a *Shop* (0.9%, *n* = 1). As the descriptive

analysis of the *Location Set* below shows, 104 offenders (92.9%) within the present sample left the victim in the same location as he raped her. The location within which the victim is released is not always measured in descriptive studies.

4.3.1.7 Transportation

Within the 112 cases, most offences involved the offender travelling only by *foot* (79.5%, *n* = 89). There were 8.9% (*n* = 10) involved the offender within a *car*, 7.1% (*n* = 8) involved the offender travelling by *bus* for a part of the journey, 2.7% (*n* = 3) involved the offender on a *bicycle* and within 1.8% of the sample (*n* = 2) the offender travelled by *train*.

Studies examining the transportation used within rape offences are lacking. Also, it is not always clear how the offender travelled to the *Initial approach location*; for example, if the offender broke into a property, the victim did not always see how he had got there.

4.3.1.8 Distance travelled within the offence

The distance travelled between the *Initial approach* to *Crime location* could be calculated for 109 offences. The mean distance travelled was 0.55 km (*SD* = 1.58 km), whilst the median distance travelled from *Initial approach* to *Crime location* was 0.77 km. Both measures indicate that, on average, the offenders did not seem to travel far between locations; indeed, in 43.1% (47 cases), the distance travelled from the *Initial approach* to *Attack location* was 0 km. However, an examination of the range of distances travelled reveals that, although the minimum distance was 0 km, the maximum distance was 12.57 km, suggesting that there were some offenders who took or followed victims much further away from the *Initial approach location*.

4.3.1.9 Location set

The *Location set* of the offences was also measured. This indicates the combination of locations found within the offences and any movement between the locations. This is a variable that has been used within Beauregard et al., (2007b). So, for example, the code *IA_ACVR* indicates that there were two locations within the offence; the *Initial approach location* is one and then the offender moves or follows the victim to the another location which serves as the *Attack*, *Crime* and *Victim release* location. Table 4.3.1.9 shows the percentage of types of Location set within the present sample.

Table 4.3.1.9 Percentage of types of Location set (*N* = 112)

Location set	Percentage (*N* = 112)
IAACVR	39.3
IAA_CVR	30.4
IA_ACVR	13.4
IA_A_CVR	9.8
IAA_C_VR	3.6
IAAC_VR	2.7
IA_A_C_VR	0.9

As this shows, the most frequent *Location set* was *IAACVR* (39.3%, *n* = 44), where the offender initially approached, attacked, committed the crime and released the victim all in the same location. The next most frequent percentage was found for *IAA_CVR* (30.4%, *n* = 34), where the offender initially approached and attacked the victim in the same location and moved the victim to another location to rape her and release her. The *Location set IA_ACVR* was the next most frequent (13.4%, *n* = 15), showing that the offender initially approached the victim in a particular location and then used another location to attack, rape and release the victim. *IA_A_CVR* was the next most frequent *Location set,* constituting 9.8% of the sample (*n* = 11). This means that the offender initially approached the victim in one location, attacked her in another and took her to a different location where he raped and released her. Less frequent Location sets included *IAA_C_VR* (3.6%, *n* = 4) where the offender initially approached and attacked the victim in one location and took her to another location to commit the crime. From here, he released her at a different location. *IAAC_VR* was also less frequent (2.7%, *n* = 3), where the offender only moved the victim at the end of the offence, before releasing her. Lastly, and the least frequent *Location set* was *IA_A_C_VR* (0.9%, *n* = 1) where the offender used four different locations within the offence.

4.3.1.10 Types of location (public or private)

The types of location, in terms of whether they were indoors or indoors, public or private are given within Table 4.3.1.10.

Table 4.3.1.10 Percentage of Types of location (public or private) (*N* = 112)

Location	Type of location (public or private)	Percentage (*N* = 112)
Initial approach location	Indoors private	17.0
	Indoors semi-public	7.1
	Outdoors semi-public	0.0
	Outdoors public	69.6
	Private transport	0.0
	Public transport	6.2
Attack location	Indoors private	19.6
	Indoors semi-public	7.1
	Outdoors semi-public	0.0
	Outdoors public	73.2
	Private transport	0.0
	Public transport	0.0
Crime location	Indoors private	30.4
	Indoors semi-public	6.2
	Outdoors semi-public	12.5
	Outdoors public	47.3
	Private transport	3.6
	Public transport	0.0
Victim release location	Indoors private	29.5
	Indoors semi-public	8.0
	Outdoors semi-public	10.7
	Outdoors public	48.2
	Private transport	3.6
	Public transport	0.0

The offender usually encountered the victim in a location which could be classified as *Outdoors public* (69.6%, *n* = 77). This was also the most frequent type of *Attack location* (73.2%, *n* = 82), *Crime location* (47.3%, *n* = 53), and *Victim release location* (48.2%, *n* = 54).

4.3.1.11 Movement

Table 4.3.1.11 shows the types of movement (if any) between the locations.

Table 4.3.1.11 Percentage of Types movement (*N* = 112)

Locations	Type of Movement	Percentage (*N* = 112 for each location type)
Initial approach location to Attack location	No movement	76.8
	Forced	0.0
	Not forced	23.2
Attack location to Crime location	No movement	55.4
	Forced	44.6
	Not forced	0.0
Crime location to Victim release location	No movement	92.9
	Forced	5.4
	Not forced	1.8

As this shows, there was no movement between the *Initial approach* and the *Attack location* in 76.8% of cases (*n* = 86). This meant that the offender attacked the victim in the location where they first encountered each other. There was movement between these locations in 23.2% of cases but this movement was not forced. Therefore the offender was following the victim. There were no instances of forced movement between these two locations, as this would mean that the offender had attacked the victim (and therefore this would be categorised as no movement).

There was no movement between the *Attack* and *Crime location* in 55.4% of cases (*n* = 62). Therefore, the offender raped the victim in the same location as he showed her force, or threat of force. There was forced movement between these locations in 44.6% of cases (*n* = 50), meaning that the offender took the victim, by force, to the location within which he raped her. There were no instances where the offender moved, without force, between these locations, as this would mean that he had attacked her, and then not showed her any threats or forced movement after this (it is argued that after the attack, the victim would be fearful of the offender and therefore, any movement with the offender would be under the threat of violence).

Lastly, there was no movement between the *Crime* and *Victim release location* in 92.9% of the cases. This meant that the offender left the victim, or the victim managed to escape in the same place as he raped her. There was forced movement in 5.4% of these cases (n = 6), meaning that the offender made the victim walk to another location with him. In 1.8% of cases (n = 2), there was no forced movement between these locations meaning that the victim had left the crime scene and the offender had followed her.

4.3.2 Thematic analysis

Thematic analysis of all 112 victim statements yielded four *Geo-mobility styles* or themes. These four styles described the spatial behaviour of the offenders in terms of their movement within the offence, the number and types of location used. These styles can be described using the following terms:

1. *Intruded*: This style refers to offenders who approached, attacked, committed the offence and released the victims in the same indoor private location. The offender did not move the victim to another location. The Cohen's Kappa score for this style was 1, showing perfect agreement. Example: "The offender broke into her house. He raped her. The incident lasted about 10 minutes and he left."

2. *Ambushed*: This style refers to offenders who approached, attacked, committed the offence and released the victims in the same outdoor public or indoor semi-public locations. The offender did not move the victim to another location, or there was movement from the Crime location to the Victim release location. The Cohen's Kappa score for this style was 1, showing excellent agreement. Example: "Whilst in the alleyway, the offender approached her. He raped her and left."

3. *Abducted*: This style refers to offenders who used more than one location within their offence and that the movement from one location to another involved the offender using force or the threat of force. The Initial approach location was an indoor semi-public location, an outdoor public location, or on public transport. The Attack location was either an indoor semi-public or an outdoor public location. The Crime location was an indoor private, indoor semi-public, outdoor semi-public, outdoor public location or in private transport. The Cohen's Kappa score for this style was 0.90, showing excellent agreement. Example: "The suspect approached her from behind

and forced her into a car park. He raped her and took her to a street and released her there."

4. *Followed*: This style refers to offender who approached their victims in a different location to where they attacked them. Their movement between these two locations did not involve force and the subsequent attack, crime and victim release locations were all the same. The Initial approach location was either an indoor semi-public location, an outdoor public location or on public transport. The Attack, Crime and Victim release location were all the same and were an Indoor private location, an indoor semi-public location or an outdoor public location. The Cohen's Kappa score for this style was 0.78, showing good agreement. Example: "She along the road and was approached by the suspect. He then grabbed her arm. After the offence, he left."

*Example*s of the *Geo-mobility styles* are given within the next section and Table 4.3.2 shows the Geo-mobility styles alongside the percentage of Codes and Sub-Codes found within each style.

4.3.2.1 Intruded

Nineteen offences (17%) involved the *Intruded Geo-mobility style*. This style refers to offenders who approached, attacked, committed the offence and released the victims in the same *Indoor private location*. The offender did not move the victim to another location. The *Location set* code for this style was always *IAACVR*. An example is as follows:

"The offender broke into her house. (*Initial approach location*) He held a knife to her throat (*Attack location*). He raped her. (*Crime location*). He left (*Victim release location*)."

Sixteen of the offences (14.3%) involved all four of the locations being the victim's house. In nine of these, the offender broke into the victim's house whilst she was inside and this is when she became aware of the offender's presence. Sometimes, the victim would wake up with the offender standing next to her. The offender would then attack and rape the victim inside her house. In five of these cases, the offender knocked on the victim's front door or rang on her doorbell, attacking the victim when she opened the door. In two of these cases, the offender approached the victim when she was at her front door, forcing his way inside and raping the victim there. Three offences (2.7% of all cases) involved all four locations as the victim's place of work. In two cases, the offender came to the victim's workplace and entered without force. In another offence, the victim was robbed at work and then raped.

There are three main commonalities between the *Intruded* offences. Firstly, most of these offences included the offender breaking or forcing their way into a place occupied by

Table 4.3.2: The Geo-mobility styles alongside the percentage of Codes and Sub-codes found within each style

Theme	Codes and Sub-codes	Percentage of Codes and Sub-codes found within each style	Examples
A. Intruded 19%; 17 cases	IAACVR All locations: Indoor private No forced movement	100 100 100 100	"The suspect broke into her house. He raped her. The incident lasted about 10 minutes and he left."
B. Ambushed 25.9%; 29 cases	IAACVR IAAC_VR Initial approach location: Outdoor public Indoor semi-public Attack location: Outdoor public Indoor semi-public Crime location: Outdoor public Indoor semi-public Victim release location: Outdoor public Indoor semi-public Indoor private Forced movement at the end of the offence	89.7 10.3 89.7 10.3 89.7 10.3 89.7 10.3 82.8 13.8 3.4 10.3	"She was walking down the alleyway when the suspect attacked her and raped her. He backed off and she got up and went home." "She entered the car park. It was here where she was attacked. Once the attack was over the suspect left the scene, his direction of travel is unknown."

Table 4.3.2: The Geo-mobility styles alongside the percentage of Codes and Sub-codes found within each style

Theme	Codes and Sub-codes	Percentage within each style (%)	Examples
C. Abducted 44.6%; 50 cases	IAA_C_VR IAA_CVR IA_A_C_VR IA_A_CVR	8.0 68.0 2.0 22.0	"..She states the suspect approached her from behind and forced her to walk with him. Once at the outside public place, he raped her. After the offence, they walked together and the victim ran away once she was in an indoor semi-public place."
	Initial approach location: Indoor semi-public Outdoor public Public transport	8.0 84.0 8.0 6.0 94.0	"She was approached the offender, he grabbed her and took her to his house. After raping her, he let her go."
	Attack location: Indoor semi-public Outdoor public	24.0 4.0 26.0	"As she left, a male approached her. The male continued to follow victim and to talk to her...when they were at a location, the man grabbed hold of the victim and pulled her into an address... Once inside, the man took the victim to an upstairs bedroom... When the victim had calmed down, the man walked her to the end of the road, where he left her."
	Crime location: Indoor private Indoor semi-public Outdoor semi-public Outdoor public Private transport	38.0 8.0 20.0 6.0 24.0 42.0 8.0	"She was followed from a train to the street where the suspect attacked her and took her to another outside location. He raped her and ran off."
	Victim release location: Indoor private Indoor semi-public Outdoor semi-public Outdoor public Private transport	100	
	Forced movement		

Table 4.3.2: The Geo-mobility styles alongside the percentage of Codes and Sub-codes found within each style

Theme	Codes and Sub-codes	Percentage within each style (%)	Examples
D. Followed 12.5%; 14 cases	IA_ACVR Initial approach location: Indoor semi-public Outdoor public Public transport Attack location: Indoor private Indoor semi-public Outdoor public Crime location: Indoor private Indoor semi-public Outdoor public Victim release location: Indoor private Indoor semi-public Outdoor public No forced movement	 7.1 71.4 21.4 21.4 14.3 64.3 21.4 14.3 64.3 21.4 14.3 64.3 100	"She walked further along the road and was approached by the suspect He followed her down the road, attacked her and raped her in the same open space and left. "She was approached by a male on the street. He followed her, raped and released her on another street."

the victim. Secondly, the offence included no movement from location to location. Thirdly, the locations all provided seclusion for the offender to carry out the offence. There is one small difference between offences within this category; namely, the type of location within which the offence occurred. In most this was the victim's house, but it was also the victim's work place in three cases.

This type of *Geo-mobility* has been found or examined in other studies of rape. Warr (1998) and Beauregard et al., (2007b) refer to this as 'home-intrusion' rape, whilst LeBeau (1987b) refers to this as Illegal entry and Fossi et al., (2005) refer to such stranger attacks as 'bedroom rapes.' Beauregard et al., (2007b) found that the home-intrusion track was found in 11.9% of the 361 serial sex crimes they examined, whilst LeBeau (1987b) found a much higher percentage of illegal entry cases; 50.7% (N = 190) of stranger rapes had involved such a method of approach. However, LeBeau's (1987b) sample comprised of serial and undetected ('open') offences as well as detected cases. It is not clear how many of these cases (involving illegal entry and a stranger assault) were one-off offences.[19]

Beauregard et al., (2007b) relate how such offences require criminal skill or knowledge (that is, how to break into a house). They also state that such a task is not without its risks; the process of breaking in may alert neighbours or set off a burglar alarm. However, they claim that, if the offender is successful at breaking in, the 'benefits' include a higher probability of carrying out the rape without being interrupted. When the target choice is the victim's house, offenders have explained this location as having added seclusion, a lower possibility of being interrupted, they can have extended time with the victim and they do not need to relocate to a 'safer' place (Beauregard et al., 2007b); in some cases, offenders have chosen to attack victims in such private places for the excitement or thrill (Beauregard et al., 2007a). As Beauregard et al (2007b) purport, the 'benefits' of raping a victim in her own home or another indoor private location, are that he has more time and the space to rape her and there is less chance of someone disturbing the offence or the victim alerting witnesses. This may be particularly the case if the victim is the only resident of the property or is at home on her own. In these cases, as Warr (1988, p.278) argues "once the home is entered, the woman is at greater risk of rape since there are no other persons to intervene."

Rapes that occur in residential homes are often though as having the same 'opportunity structure' as burglaries (Warr, 1988). Thus, offenders may find particular targets 'attractive' in the same way as burglars do, assessing and choosing homes to break into that

[19] It is acknowledged that there are a few serial offenders within the present sample; however, only one offender used the Geo-mobility style of Intruded twice within the original Stranger rape sample.

are easy to access, that offer limited surveillance from the street and that may offer high potential rewards (in this case, perhaps, females living on their own) (Bennett & Wright, 1984).

4.3.2.2 Ambushed

This *Geo-mobility style* was found in 29 offences (25.9% of cases).This style refers to offenders who approached, attacked, committed the offence and released the victims in the same outdoor public or indoor semi-public locations. The offender did not move the victim to another location, or there was movement from the *Crime location* to the *Victim release location*. In 26 cases, the offender released the victim in the same place (that, the *Location set* code was *IAACVR*); in three of these cases, the offender released the victim in another location (*IAAC_VR*). An example of *IAACVR* is as follows.

"The victim was walking through an alleyway and noticed the offender behind her. (*Initial approach location*) He threatened her with a weapon (*Attack location*). He raped her. (*Crime location*). He let her go after the rape." (*Victim release location*)."

Within the *Ambushed* style, movement is minimal and only occurs (if at all) at the end of the offence between the *Crime location* and the *Victim release location*. An example of this is as follows:

"She noticed the man in the outside open space. (*Initial approach*). (*Attack Location*). He dragged her a few metres. (*Crime Location*). The victim persuaded the offender to go to another location and ran away from him there. The victim ran away from the suspect (*Victim release location*)."

In all three cases, the first three locations were all outdoor public locations. The reason for inclusion within this category is due to the change in the location of the victim release site being instigated by the victim in all three cases. In two of these cases, the victim left the suspect at the *Crime Location* and he followed her back to the street by her house; in another, the victim managed to escape from the offender by persuading him to walk with her.

Out of the 26 cases where the entire offence was in the same location, 23 cases occurred in an *Outdoor public place*; a park or common, an alleyway, underpass or footpath, or on the street. Eleven of these *Ambushed* types of offences occurred in a park or common. In some of these cases, although the entire offence occurred in the park itself, the offender may have dragged the victim to a more secluded part of the park to carry out the offence. An example illustrates this: "He grabbed her at the neck and dragged her into an alcove in the park." Minimal movement may also have occurred at the beginning of the offence. In one

case, the victim described how she was walking along a path in an open space when she noticed the offender. She tried to walk away from him, but he ran over to her.

In six *Ambushed* cases, the entire offence occurred as the victim was walking down the street, becoming aware of the offender only just before he attacked her. For example, one victim described how she only realised the offender was there when she "saw his feet". In other offences, it is clear that the offender was stationary, as if waiting for a victim to pass. One victim described how she walked past the suspect and he attacked her just after she had passed him.

As with the *Ambushed* offences that occurred in a park, there was some minimal movement within those that occurred within the street. For example, as the victim was walking past an address, one offender, seemingly waiting for a victim, pulled her into the 'grass-like' area of the street. In another offence, the offender pulled the victim from the street to a ditch.

In five of the *Ambushed* cases where all of the offence occurred in one location, this location was an alleyway, footpath or subway (underpass). A typical example of such an attack includes the case where the victim walked through an alleyway and heard footsteps behind her. In another case, illustrating another example of minimal movement, the offender attacked the victim in an alleyway and then dragged her to a set of bushes within the alleyway and raped her there.

Out of the 26 *IAACVR* cases within the *Ambushed Geo-mobility style*, three of these occurred within an indoor semi-public location. One example is within an indoor car park. The victim described how "she entered the car park, and it was here where she was attacked. Once the attack was over, the suspect left the scene." Another example occurred within public toilets, where an unknown offender pushed his way into a cubicle. Lastly, an offender was waiting in a lift within a block of flats when the victim entered it.

In summary, there are three underlying similarities within the *Ambushed* offences. Firstly, there was little or no movement within the offence; movement only occurred at the end of the offence and was instigated by the victim rather than the offender. Secondly, all locations were relatively isolated; even when the offender attacked the victim on the street, he used minimal movement get the victim to a more secluded area within the same street. In other cases, the locations were ones that seemed to have an absence of other people around and lower visibility to onlookers (for example, a park or an underpass). Thirdly, the description of the cases seems to suggest that the offender was 'lying in wait' for the victim; for example, within the indoor semi-public locations (lift, indoor car park), the victim was

'ambushed.' There is one small difference between offences within this style. This is that there was minimal movement in three cases at the end of the offence. This movement, however, was always instigated by the victim.

The *Ambushed* offences bear similarity to the Raptor approach within Rossmo's (1997) model. Here Rossmo describes how offenders adopting such an approach will attack the victim immediately after encountering her. This style is also similar to the Direct rape action track from Beauregard et al., (2007b), found in 11.9% of offences. This style differs somewhat though; within the Direct action rape track, all of the locations within the offence (although the same) are usually within an indoor public space. The *Ambushed style* is usually within an outdoor public location. Beauregard et al., (2007b, p.1081) regard the Direct action rape track as one "which exhibits little or no investment by the offender, no sophistication…" This may be applicable to offenders who exhibited the Ambushed style of Geo-mobility within the present sample.

As stated previously, the *Ambushed Geo-mobility style* may involve the offender laying in wait for his victim. Interview studies confirm that sex offenders will often wait around suitably isolated places. Beauregard et al., (2007a, p. 456) cite one offender who stated that he "...always hung out by the woods near the bike path, plenty of people went through there because it was a shortcut." (p. 456). Such places, although providing potential victims, may not often be policed by a capable guardian, for example, members of the public. The attacks are less likely to gain attention; if the victim struggles or the attack creates high levels of noise, there will be fewer chances of alerting attention.

4.3.2.3 Abducted

The *Abducted* style refers to offenders who used more than one location within their offence who moved the victim from one location to another using force or the threat of force. This was the most frequent *Geo-mobility style* found in 50 cases (44.6%). The *Initial approach location* was an *Indoor semi-public location*, an *Outdoor public location*, or on *Public transport*. The *Attack location* was either an *Indoor semi-public* or an *Outdoor public location*. The *Crime location* was an *Indoor private*, *Indoor semi-public*, *Outdoor semi-public*, *Outdoor public location* or in *Private transport*.

Overall, the *Initial approach locations* were less isolated, less secluded than the *Attack* and *Crime locations*. The location where the offender first encountered the victim was usually the street, sometimes at bus stops or areas related to public transport (for example on the bus or at a train station). As this sections goes on to explain, the offender usually attacked

the victim within the same place as he encountered her. He then usually took her to a place where there were less people around to rape her. Locations where the crime occurred usually included the suspect's house, the victim's house, the park, an alleyway, a car and a stairwell. These locations provide an added level of 'safety' for the offender, in terms of the chance of being interrupted. It could be argued that some of these areas (i.e. his house or car) are ones within which the offender has more control.

The most common *Location set* category within the *Abducted* style was *IAA_CVR* which occurred in 34 cases. This meant that it involved the offender initially approaching and attacking the victim in the same place and forcibly moving the victim to another location to commit the crime. Here the offender would leave, be disturbed or the victim would run away. An example is as follows:

"She was approached by the suspect in the street (*Initial approach location*)...he grabbed her (*Attack location*, same as before)... and took her to his house (*Crime location*)....After the offence, she was permitted to go (*Victim release location*, same as before)."

This most frequent combination of locations within the *IAA_CVR* category was where the offender approached and attacked the victim in an outdoor public location and then would take the victim to another outdoor public location. This occurred in 13 cases. In all but one cases, the offender initially approached and attacked the victim in the street (in one case an alleyway) and forced her to go to another, more isolated area. In nine cases, this was to an alleyway or a footpath; in three cases, the crime location was a park; in the last case, the offender took the victim to another street.

The next frequent *Location set* code within this category was *IA_A_CVR* which occurred in 11 cases. This involved the offender initially approaching the victim, moving with her, without force, to another location where he attacked her and took her to a different location to rape her, where he released the victim. An example is as follows:

"The victim got off the train and noticed a man watching her (*Initial approach location*). She walked down ADDRESS and he grabbed her (*Attack location*). The suspect then dragged her to another outside public place (*Crime location*). He was disturbed and ran off. The suspect ran off pulling his trousers up as he ran off in the direction of ADDRESS (*Victim release location*)."

In two of these cases, the offender initially approached the victim in an *Indoor semi-public location*, and in both of these cases, the location was inside a train station. In the five

cases, the location was an *Outdoor public location*, always in the street. In four cases, *Initial approach location* was on public transport.

As stated previously, the movement between the *Initial approach location* and the *Attack location* within this category was not forced. The victim had noticed the offender before the attack and had moved to another location. The offender has followed the victim from the public place, to the *Attack location*. In some cases, the movement between these two locations was minimal, from one street to the next street; in other cases, the movement was over a greater distance. In one case, the offender approached the victim on the street, followed her as she took a bus journey and attacked her when she had alighted and was walking down another street. Within all but one case, the *Attack location* was an *Outdoor public place*. When the *Attack location* was an *Outdoor public place*, usually the offender had initially approached the victim on a street and had followed her to another street to attack her. In four cases, however, the victim had first noticed the offender on a bus and had attacked her as she had alighted and was walking down another street. In two cases, the offender had followed the victim from a train station and attacked her on the street. In one case, was an *Indoor semi-public place* (a lift within a block of flats); the offender had followed the victim from the street into the lift.

Movement from the *Attack location* to the *Crime location* was always forced. In the one case where the *Attack location* was an *Indoor semi-public place* (the lift) the offender forced the victim to another *Indoor semi-public location*, a utility area in the same block of flats. This movement was therefore limited but the offender had moved the victim to a distinctly different location. In four cases, the offender attacked the victim on the street and moved her to another *Outdoor public location*. In all of these, the *Crime location* was slightly more secluded than the *Attack location*. In two cases, the rape occurred in a more secluded part of a different street, in the other two cases, this location was an alleyway or a footpath.

In four cases, the *Crime location* was again, a more secluded area; an *Outdoor semi-public location*. In two of these cases, the location was a residential front garden; in another the victim was raped in an area where there was garages and in another, an outdoor car park. In one case, the victim was taken to the offender's car to be raped. Lastly, one offender attacked the victim on the street and forced her, at knife point, to her house (an *Indoor private location*) and raped her there.

The movement between the *Attack location* and Crime location was minimal at times (for example from one street to a more secluded street) and longer at others (for example,

when the offender took the victim to her house, they walked several streets during which time he went to a shop). The offender always left the victim at the *Crime location*.

In four of the *Abducted* cases, the *Initial approach* and *Attack location* were the same, whilst the offender moved the victim to the *Crime location* to rape her. He also moved with the victim to a different *Victim release location*; this is the *IAA_C_VR Location set* code. An example is as follows:

"The suspect approached her from behind and forced her to walk with him. He raped her in an outside public place and took her for a walk afterwards, where she escaped when they reached and inside semi-public place."

In all of these cases, the *Initial approach location* was an *Outdoor public place*. In three of these, this was the street; in one an alleyway. The *Attack location* was the same place. In terms of the *Crime location*, movement from this location to another was always forced. In two cases, the offender took the victim to his own house. In both of these cases, the distance was relatively far (compared with other cases). In one, the offender made the victim walk down several streets; in the other, the offender forced the victim into a car and drove her for "about half an hour" to his house. In a one case, the *Crime location* was a park; the offender attacked the victim in an alleyway and walked her to a secluded part of a neighbouring outside open space to rape her. Lastly, one *Crime location* was a *Semi-public location*; an outdoor car park.

In most cases, the offender moved or followed the victim to an *Outside public location* and left her there. In one case, this movement was not forced; the victim was allowed to leave the suspect's house where he had raped her and he followed her up the road, eventually leaving her alone. In another case, the offender took the victim from his house, by car, dropping her off on a street. Another offender raped the victim in a park and walked her back to the alleyway where he had attacked her. Lastly, after the victim had been raped, she persuaded the offender to 'go for a walk and escaped in an *Indoor semi-public location.*

Finally within the *Abducted Geo-mobility style*, there was one case where the offender used four different locations within the offence; the *IA_A_C_VR Location set* code. Here, the offender initially approached the victim on the street, followed her to another street, where he abducted her, took her to his house, raped her there and took her to the end of his road and released her.

In summary, the *Abducted Geo-mobility style* is the most varied, in terms of spatial behaviour than the other three styles. However, there are three similarities between the offences within this style. Firstly, there was forced movement, at some point, within the

offence. Secondly, the *Initial approach location* was always in a *public* or *semi-public* location. Thirdly, the *Crime location* was always more secluded than the *Attack location* (if these locations were different). There were two main differences within *Abducted* cases; the first is that the movement within the offence varied, from minimal (for example, from an alleyway on the side of a park to the park itself) to a greater distances (for example, the victim being driven from the street for 30 minutes). Secondly, the range of *Crime locations* was wider than within the other locations. The types of location varied, in terms of privacy, from the suspect's house to a park.

Other studies have found similar methods of approach or types of spatial behaviour within sex offenders. For example, LeBeau (1987b, p. 316) found that 'kidnap-attack' was a method of attack often used in undetected, single and serial offences. Indeed, he found that, within the rapes perpetrated by a stranger, 25.3% (N = 190) had involved a kidnap style attack. Again, however, it is not clear how many of these were detected, one-off offences. LeBeau's (1987b) model does differ slightly however as he explains that this method only occurs in an outdoor setting and is characterised when "the offender immediately applies force to neutralise the victim." Within the *Abducted* offences, the offender, in some cases, forced the victim from an indoor semi-public location. Also, offenders would not always attack the victim on initial approach and would follow her until the attack location.

The *Abduction geo-mobility style* is similar to elements of Beauregard et al., (2007b)'s Outdoor rape tracks A and B. Within the Outdoor rape track A, the offender will commit the entire offence outside and will take the victim to another outdoor location to rape her. This is similar to one case within the Abducted style where the offender initially approached and attacked the victim in an alleyway, took her to a park and raped her and then took her back to the alleyway to release her. Within the Outdoor rape track B, the initial approach and attack location is an outdoor private location, such as a back garden; the offender kidnaps the victim and takes her to an indoor location, and she is usually released in an outdoor location. This exact grouping was not found as all the *IAA_C_VR Location sets* within the *Abducted style* consisted of the victim being approached in an outdoor public, rather than private location. However, within these, there were two cases where the offender took the victim to an indoor private location and then released her back into the street. Rossmo's (1997) model does not account for the method of kidnapping the victim, nor the combinations of types of offence location that might be involved.

4.3.2.4 Followed

All fourteen of the *Followed* offences, by nature of the definition, consisted of the *IA_ACVR Location Set*. Therefore, the offender followed the victim to an *Attack location* where he also committed the offence and then released the victim.

The *Initial approach locations* within the *Followed Geo-mobility style* offences seemed to be less secluded or isolated than that of the *Attack* (and therefore, the *Crime location*). The *Initial approach locations* included streets, the bus, and a shop. When the *Initial approach location* was the street, the offender would follow the victim to another location where he would attack her there; there were only two cases (where the *Initial approach locatio*n was a street) within which the offender attacked the victim on another street. In most cases, he would follow her to a park, a lift, her house, a car park, an alleyway, or a footpath where he would attack her.

In more detail, in six of these offences, the offender initially approached the victim in an *Outdoor public location* (the street) and has followed the victim to another *Outdoor public location*. In three of these cases, this was an alleyway or pathway; in two it was a park and in one case, it was on a different road.

The distances travelled by the victim and offender between the *Initial approach location* and the *Attack location* within these cases were mostly short (as above) and sometimes longer. Another example of this is when a victim "noticed the suspect walking behind her on the same side of the road, he then walked across to the opposite side of the road; the victim has then walked into an alleyway. The suspect attacked her."

In three offences, the *Initial approach location* was on public transport (a bus in all cases). From here, the offenders followed the victim to an *Outdoor public location* in two cases; in one a park and in another, a different street. In the last case, the offender followed the victim from the bus until she got to her own house, where he pushed her inside and raped her there.

In two offences, the victim was followed from an *Outdoor public location* to her own house where she was attacked and raped. One victim recounted how "She noticed a male had started walking behind her. She turned into her street. He managed to push the door open and came inside the hallway."

In two offences, the offender followed the victim from a street and attacked her in an *Indoor semi-public location*; one of these was a communal area within a block of flats, whilst the other was an empty underground car park. Lastly, in one offence, the offender followed

the victim from inside a shop and raped her in an alleyway. In all *Followed* offences, the *Crime* and *Victim release* locations were all the same.

In summary, there are two main similarities within the *Followed* offences. The first is that there is no forced movement between offence locations. Secondly, the offender seemed to wait until the victim got to a more secluded area before he attacked her. The main difference within these offences is that the distances between the *Initial approach location* and *Attack location* seem to vary (although not greatly). Therefore, in some cases, the victim noticed the offender behind her shortly before he attacked her; in others, the offender followed the victim for a few streets or a bus journey before he attacked her.

Beauregard et al., (2007b) and LeBeau (1987b)'s studies do not include similar styles of spatial behaviour to compare to the *Followed Geo-mobility style*. However, Rossmo (1997) does describe a Stalker offender who will operate in an opportunistic manner and follow a victim until he decides it is 'safe' to attack her. It could be argued that the offender noticed the victim whilst travelling along routes on which he normally carried out his routine activities (C/F Cohen & Felson, 1979). After doing so, he followed her to a place which he assessed as posing less risk and greater 'benefits' (lack of a guardian, less chance of being interrupted) (C/F Rational Choice Theory, Cornish & Clarke, 1986) and raped her there.

4.4 Similarities and differences between the Geo-mobility styles

The *Intruded* and *Ambushed* styles were similar because the entire offence usually occurred within the same location. For some reason, the offender did not move the victim. It could be argued that the location within which the offender encountered the victim was secluded enough to commit the offence there and then rather than risking moving her to another place. As LeBeau (1987b, p.313) notes, "the joint movement of the victim and offender from different scenes takes time. Therefore, it can be assumed that this travel time allows the victim to acquire or recall additional details about the incident and her assailant." Presumably, therefore, the offender will not, ideally, move the victim and any movement that does occur may be influenced by characteristics of the locations involved, offender or victim behaviour.

Movement may be related to the level of seclusion that each offence location offered. This may mean that, the location within which the offender initially encountered the victim in the Intruded or the Ambushed style may have been more conducive to committing the crime. The locations could be isolated enough for the offender to select it as an ideal 'hunting ground' in which to select their victims (C/F Beauregard et al., 2007a).

Equally, the use of minimal or moderate levels of mobility within the Followed or Abducted style may reflect this issue. Within those offences where movement is minimal or moderate, the Initial approach location may be near to another more 'suitable' location within which to rape the victim. Therefore, within the *Abducted* offences, the offender would forcibly take the victim to such an area; within the *Followed* offences, the offender will wait until the victim walked past or into the area. Offenders who abducted their victims and took them to a location further away may have done so because of the level of isolation the Crime location may bring (for example within the offender's own home). Offenders, who followed their victims for longer distances, may have done so because the victim did not walk past a location which was suitable enough to complete a rape without being disturbed.

Movement between offences may also be effected by potential or victim resistance. Within the *Intruded* offences, the location of the crime may have been isolated enough for the victim to resist relatively loudly but there would be no-one near to be alerted. Within the *Ambushed* offences, it could be that offender used so much force, that the victim may have been too overpowered to struggle (this will be discussed within Chapter Six).

It could also be said that this movement may increase the likelihood that witnesses may disturb the rape. However, the main difference between these two *Geo-mobility styles* was the type of location within which they occur; within the *Intruded* offences, the venue was usually the victim's house (an Indoor private location), whilst in the Ambushed offences, the venue was usually a park or a street (an Outdoor public location). These locations offer different 'benefits' and risks for the offender; within the Intruded offences, the offender risked apprehension through breaking into the victim's house (Beauregard et al., 2007b), but could 'benefit' as there was a decreased likelihood of being interrupted (Warr, 1998). Conversely, within the *Ambushed* offences, the offender risked the offence being witnessed (perhaps because the victim could be heard, or there was someone walking past) but, by committing the offence in a place that was outside, they may have access to more potential victims than perhaps the *Intruded* style would provide (C/F the interview study carried out by Beauregard et al., 2007a). Further differences between these two styles are explored in Chapter Six.

Cases within the *Intruded* style were similar to some cases within the *Abducted* style in terms of the location within which the offender raped the victim. As argued within the *Intruded style*, such a location provides the offender within a place within which the offender can complete the rape with less chance of interruption. However, it could be argued that, if the rape location is the suspect's house, this would provide more of chance to be alone with

the victim and not to get disturbed than within the *Intruded* cases. The offender does not have to break into the victim's house within these cases either, an activity that may prove to be risky. However, as already mentioned, the act of moving the victim from one location to another is in itself risky; this does not occur within the *Intruded* offences.

The *Intruded* cases are similar to some cases within the *Followed* style. These are the instances where the offender has followed the victim to her own house and attacked her there. However, within the *Followed* offences, the offender did not have to break into her house; rather, he usually used force to push the victim through her own front door. Moreover, the main difference between these two *Geo-mobility* styles is that there is no movement within the *Intruded* style, whilst there is in the *Followed* style. It is argued that the main reason for this is the movement of the target (i.e. the victim) within the *Followed* offences; within the *Intruded* offences, the target, in effect, is the victim's house rather than the victim. This is, therefore, a stationary target.

The *Ambushed* style is similar to some of the cases within the *Abducted* style, in terms of the type of *Initial approach* and *Attack* or *Crime* locations. Within the latter, the offender first encountered the victim mostly in an outdoor location. Equally, within some *Abducted* styles, the *Attack* or *Crime locations* were sometimes within an outdoor public place. As argued previously, some of these locations are conducive to crime, with a lack of guardianship and increased seclusion (as opposed to busier areas). However, the difference between the *Ambushed* and the *Abducted* style is the lack of movement used; in the former style, the offender attacked and raped the victim 'there and then' whilst, within the Abducted offences, the offender took the victim to another location where he raped her. It could be that, in the *Abducted* cases, the offender made an assessment of the suitability of the area he encountered the victim and decided it was 'safer' to move her to a different location. It can also be suggested that offenders will assess the initial approach location as too risky a place to rape their victim and that, therefore, they will wait until the victim moves to a place that is more secluded or isolated, or generally more suitable for the commission of crime (Amir, 1971). However, without interviewing the offenders, this decision making process cannot be directly measured.

Within both the *Ambushed* and *Followed Geo-mobility styles*, the venue for the entire offence was usually an outdoor one. As described previously, within the *Followed* offences, the offender seemed to wait until the victim had moved to a more secluded location. In the *Ambushed* offences, it seems that the victim was already in a secluded location. This could also be an explanation for the main difference between the styles; there was movement within

the *Followed* offences, whereas there was a lack of movement within the *Ambushed* offences. It could be, therefore, that there was no need to wait until the victim moved within the latter cases

The *Abducted* and *Followed* styles were similar in the fact that they both occurred over more than one location. However, they differed by way of the manner in which the movement between locations was carried out. In the *Abducted* style, the offender would, at some stage, forcibly move the victim from one place to another, whilst within the *Followed* style, the offender would follow the victim, without force, to the location within which he would attack and rape her. The offender within the *Abducted* cases, therefore, had more control over where the rape will occur; it could be argued that he made a decision about where to rape the victim, rather than waiting for the opportunity to strike. Again, this decision-making process would have to investigated by interviewing offenders; however, results from Beauregard et al., (2007a, 2007b) can help us to start to form ideas about why the offenders approached, attacked, and raped the victims where they did.

4.5 Chapter summary

This chapter offered a descriptive analysis as well as providing a thematic analysis of the offenders' spatial behaviour *within* the offences. There was a higher concentration of offences within the centre of London, with a more dispersed spread of offences as the distance from the centre decreased. This supports work from research which relates how crime, in general, is usually concentrated within the older cities' Central Business District (for example, Boggs, 1965) and also supports more recent work, specifically examining rape within the MPS region (Ruperal, 2004). Usually offences occurred within one or two locations, supporting the work of Beauregard et al., (2007b) who found that, usually, offenders do not travel far *within* their offences. The majority of offenders travelled on foot, a finding supporting those from Snook (2004) who examined the transportation styles of robbers. The offenders usually approached and attacked the victim in an outdoor public location, notably the street. Other studies examining types of locations have also noted that stranger rapists will usually encounter their victims on the street (for example, Ruperal, 2004) and this can be explained by Routine Activity Theory (Cohen & Felson, 1979). The type of location of the crime and victim release locations was found to be different however. In most cases, the offender raped and released the victim in her own house, a result also found within Jones et al., (2004). Offenders may do so because such a location may provide an opportunity for the offender to complete the rape without the risk of being interrupted (Warr, 1988).

The thematic analysis drew out four *Geo-mobility styles*. These provided a 'story' of the rape event itself, emphasising the way in which the offenders moved within their offences. Those who used the *Intruded* style approached, attacked, committed the offence and released the victims in the same indoor private location. Those who *Ambushed* their victims approached, attacked, committed the offence and released the victims in the same outdoor public or indoor semi-public locations. The offender did not move the victim to another location, or there was movement from the *Crime location* to the *Victim release location.* Those who *Abducted* their victims used more than one location within their offence and the movement from one location to another involved the offender using force or the threat of force. The *Initial approach location* was an *Indoor semi-public location,* an *Outdoor public location,* or on *Public transport*. The *Attack location* was either an *Indoor semi-public* or an *Outdoor public location*. The *Crime location* was an *Indoor private, Indoor semi-public, Outdoor semi-public, Outdoor public location* or in *Private transport.* Those who *Followed* their victims approached their victims in a different location to where they attacked them. Their movement between these two locations did not involve force and the subsequent *Attack, Crime* and *Victim release locations* were all the same. The *Initial approach location* was either an *Indoor semi-public location,* an *Outdoor public location* or on *Public transport.*

The *Geo-mobility styles* showed a dynamic picture of the offenders' spatial behaviour from the victims' statements. The *Intruded* style was similar to that found by Warr (1988) and Beauregard et al., (2007b) who examined and found a 'home intrusion' style rape within the offences examined. Reasons for the exhibition of this style may be that the offender chose such a location because of the seclusion it offered (Beauregard et al., 2007b) and the potential 'attractiveness' or 'rewards' particular types offered (for example, a female living on her own) (Warr, 1988). The *Ambushed* style was similar to Rossmo's (1997) Raptor approach as well as Beauregard et al., (2007b)'s Direct Action rape track. Offenders may use this approach as they are already located within areas which offer seclusion and isolation (such as parks or commons) and therefore, take the opportunity to attack their victims (C/F Beauregard et al., 2007a's interview studies with serial rapists). The Abducted style was similar to LeBeau (1987b)'s 'kidnap' style attack and Beauregard et al., (2007b)'s Outdoor rape tracks, although these tracks offered different 'combinations' of types of initial approach, attack, crime and victim release location. Reasons for the *Abducted* style could be to do with the location of the initial approach; Beauregard et al., (2007a) found that offenders moved their victims because the area within which they initially encountered was busy or less secluded than the crime location. Lastly, the *Followed* style bears resonance to Rossmo's

Stalker method of approach, where the offender followed his victim until there was an opportunity to attack her. It could be argued that the offenders followed their victims because the *Initial approach location* was one that was too busy. The offenders therefore, waited until the victim got to a more isolated location to commit the offence (C/F Beauregard et al., 200a).

The findings of this chapter have important implications for theory of offenders' spatial behaviour, intelligence-led policing. Firstly, both the descriptive and the thematic analysis provide further support for ideas around Routine Activity Theory (Cohen & Felson, 1979). Offences are more closely concentrated within areas where population and social interaction levels are higher, in the centre of London, increasing the likelihood that the paths of a motivated offender and a vulnerable victim will meet. Also, as the descriptive analysis highlighted and the 'stories' within the thematic analysis related, the initial approach location was more likely to be in an outdoor public place, whilst the crime seemed to occur at a more secluded, isolated location. Thus, ideas from Rational Choice Theory (Cornish & Clarke, 1979), that offenders will weigh up the supposed risks and benefits before committing crimes may ring true.[20] Some offenders seemed to either approach and attack victims in a location that was already isolated (the *Intruded* and *Ambushed* styles), whilst others moved or followed their victims to areas which provided more seclusion that the location within which they initially approached the victim (therefore, *Abducted* styles).

The findings also have implications for intelligence-led policing. Knowing where the most likely location for the initial approach, attack, crime and victim release locations are could help to inform processes such as situational crime prevention. Thus, the public can be made aware of the security risks particular locations pose and measures can be put in place to ensure that more secluded or isolated areas have access to or are 'protected' by capable guardians (for example, CCTV or police patrols). This will be discussed further in Chapter Nine.

This chapter does have limitations. Firstly, as stated within Chapter Three, previously, the crimes described here are detected and therefore, assumptions cannot be drawn about the spatial behaviour and *Geo-mobility styles* within undetected stranger rapes. However, because the study of such behaviour does not rely on information about the offender's characteristics or other details that could only be ascertained when the offender is apprehended, this means that undetected offences could be examined in future studies.

[20] It is acknowledged that without interviewing offenders, such suggestions are only hypotheses. Further studies need to be carried out to test such ideas.

A second limitation of this chapter is one that is directed at the technique of thematic analysis. As Joffe and Yardley (2004, p.66) suggest, examining phenomena such as this, (by extracting themes) "abstracts issues from the way that they appear in life, organising material according to the researcher's sense of how it connects, rather than the inter-relationship of themes in the participant's mind or lifeworld (see Boyatzis, 1998)." Therefore, because the current author is examining the victim's interpretation of events (which has been interpreted by a police officer) and thus further interpreting the narrative, it could be argued that there is a level of subjective bias around the themes derived and the ensuing explanations. It is necessary, therefore, for such analysis to be carried out on different samples, by different researchers to ensure a greater level of objectivity. However, as Joffe and Yardley (2004) go on to argue, this method of qualitative analysis fairs better than others in this respect (for example using in-depth narrative analysis of case studies). The thematic analysis used within this chapter examines a number of cases (over 100) and therefore, the findings can be thought of as more valid (Joffe & Yardley, 2004). Equally, as argued within the introduction of this chapter, the use of qualitative analysis over quantitative analysis for examining the complex inter-relationships between the location types and other spatial variables may better explain the 'stories' of the offenders' spatial behaviour.

In summary, this chapter examined the dynamic nature of the offenders' spatial mobility and explained that the four *Geo-mobility styles* were similar and different in many ways. The next chapter examines the verbal and non-verbal behaviour of the offenders within the offences. Following this, Chapter Six explains how such behaviour may be related to the *Geo-mobility styles* and goes on to consider how these may compare in other ways.

CHAPTER FIVE
OFFENCE BEHAVIOUR

This chapter presents a model of the offence behaviours exhibited within the 112 stranger rapes. Previous multivariate research studies have established criminal, violent and sexual (or pseudo-intimate) themes (for example, Canter, Bennell, Alison & Reddy, 2003). The main aim of the present chapter is to 1) present a detailed examination of the offence behaviours exhibited within the sample and 2) to examine the thematic nature of the offence behaviours. Content analysis of the victim statements derived 109 verbal and non-verbal reliably coded behaviours, ranging from high (for example, *Control violence*) to low frequency (for example, *Requested help*). Variables that were present in more than five percent of the sample were used to perform a Smallest Space Analysis (Lingoes, 1973). This provided empirical support for the presence of the three hypothesised themes of *Criminal*, *Sexual* and *Violent* behaviours. A variable-by-variable examination showed that some that were predicted, *a priori*, to be present in a particular theme were not. The implications for replicating studies that examine offence behaviour through the use of Smallest Space Analysis is discussed, alongside how the findings of the present chapter are relevant to theoretical models of rape behaviour as well as offender profiling and intelligence-led policing.

5.1 Introduction

5.1.1 Models of rape behaviour

As Chapter One discusses, there have been many attempts to differentiate between rapists' offence behaviour. Early classification systems (for example, Cohen et al., 1969) sought to differentiate offenders in terms of what may motivate them to rape, and centred upon internal drives such as aggression and sexual needs. The models began to develop, leading others to theorise about what other motivations may lead to rape; Groth (1979), for example, postulated that rape was not just about the need to relieve unconscious urges, but that rapists were driven by a need to control and subjugate their victims.

Since these theoretical models have been suggested, researchers have tried to validate and provide empirical support for such models. Within the clinical domain, work at the MTC has been centred up trying to establish whether classification systems based on various clinical observations can be used to classify rapists in terms of their offence behaviour (for example, Knight, 1999). At the same time, researchers and investigators at the FBI have

drawn up models, based on the work of Groth (1979) that classify rapists in terms of the basic tenets of power and anger as well as opportunism (Hazelwood, 1987).

Advocates of the Statistical Approach (Alison et al., 2010), seek to examine how offence behaviour can be differentiated into themes, depending of observable behaviour. Canter and Heritage (1990), for example, emphasise that classifying rapists on the basis of clinical observations may not be of practical use for a police officer. Instead, they purport that the structure of offence behaviour should be used as a basis of differentiating between offenders and that, such a task is useful for investigative strategies such as offender profiling (Canter & Heritage, 1990). However, as explained in Chapter One, and argued by Mokros and Alison (2002), this basis of making inferences regarding an unknown offender's characteristics, from their crime scene behaviour, may not have either a theoretical base, nor enough empirical support. Instead, it might be more realistic to suggest that examining the rape behaviour in such a way may help to inform theoretical models. Inferences can be made about the underlying empirical structure of rape behaviour based on observable actions, rather than clinical observations or conjuncture (Canter et al., 2003).

Since 1990, there have been many studies that have examined the observable offence behaviour within stranger rapes. These models were developed with the aim of complementing findings from motivational studies (Canter, et al., 2003), with studies carried out in the UK (Canter & Heritage, 1990) and throughout Europe (for example, Häkkänen, Lindlof, & Santilla, 2004). These studies have focused upon differentiating the offence actions within rapes into behavioural themes, an endeavour that is thought to be more useful than, for example, using individual offence behaviours in determining different offence styles (Canter, 2000).

Models also focus on both non-verbal and verbal behaviour (for example, Dale, Davies & Wei, 1997). The next section will summarise pertinent studies, in terms of the sample and area from which they drew their data, and will then go on to highlight recurring behavioural themes derived within these studies.[21]

[21] Please note that some of these studies have been referred to within Chapter One

5.1.2 Pertinent studies

5.1.2.1 Summaries of studies

Canter and Heritage (1990) examined 66 detected stranger rapes derived from UK police records, committed by 27 offenders. They used the multi-dimensional method of Smallest Space Analysis (described in Chapter Two) to differentiate the offence behaviours into themes. They found that offence behaviours could be separated into five themes. The first theme is that of 'Sexuality'; behaviours exhibited within this theme included vaginal intercourse and other types of sexual behaviours. Secondly, they found evidence of behaviour that were classified under the title of 'Violence and aggression.' These included "violence used as a means of controlling the victim", "violence used but not as means to control" and "aggressive verbal behaviour" (Canter & Heritage, 1990, p.200). Thirdly, there were behaviours that were deemed to exemplify 'Impersonal, sexual gratification'. Behaviours indicative of this category included impersonal language, a blitz and surprise attack, tearing of the victim's clothes and being unresponsive to the victim's reactions. Fourth, Canter and Heritage (1990) described the 'Criminality' theme, containing behaviours that included binding, gagging, stealing from the victim and telling the victim not to report the offence. Lastly, the authors found empirical support for behaviours that were all indicative of 'Interpersonal intimacy.' These included the offender complimenting the victim, apologising for his actions and asking the victim questions about herself.

Davies (1992) examined the cases of 60 offenders, most of whom had committed two or more stranger offences. By detailed examination of the victim statements and case notes, Davies (1992) gave an account of three different aspects of stranger rapist behaviour; Firstly, Davies (1992, p.175) described 'Modus Operandi' behaviours which were "behaviours involved in planning the offence, controlling the victim, avoiding arrest, remarks indicating previous contact with the police and speech and acts concerning the theft of valuables". Secondly, she described behaviours that were concerned with 'Sexual and Personal Gratification', such as the sexual acts, sexual comments or questions, excessive violence and verbal cruelty. Thirdly, Davies (1992) described behaviours that were thought to be indicative of 'Attitude and Intimacy' which included abusive language, controlling language, compliments, revealing self-details, excusing or apologising for his offences, and expressing affection.

Alison and Stein (2001) examined how and if rape behaviours could be differentiated into themes, according to the interactions between victims and offenders. Using the idea of the interpersonal wheel (Leary, 1957), they considered two samples of data; one consisting of

251 victim statements from the offences of 42 serial offenders, the other comprising of 139 victim statements from the offences of 'one-off' rapists. Both sets of data were drawn from a behavioural science unit of a UK police force. Using the MDS analysis on the latter data set, the researchers were able to show that offence behaviours could be differentiated into three themes. These were Dominance (the offender dominated and controlled his victim), Hostility (demeaning the victim, committing multiple acts of violence, and approaching the victim in a 'blitz' style attack), and Compliance-giving (fondling, kissing, reassuring the victim.

Canter et al., (2003) continued to examine the behavioural structure of rape using MDS procedures and developed a similar model using victim statements from 112 British rapes. They identified a four themed model of rape behaviour where the offences could be differentiated into Hostile (such as single and multiple acts of violence, tearing clothing), Involvement (such as fondling, reassuring), Control (binds, blindfolds) and Theft (stealing personal, identifiable and unidentifiable items from the victim) themes.

Häkkänen, et al., (2004) (discussed in further detail in Chapter One) examined the behavioural structure of rapes in Finland and replicated the most of the themes as found within Canter et al., (2003). Therefore, their Smallest Space Analysis yielded three behavioural types; Hostility, Theft and Involvement. Thus, these authors did not find control behaviours to be part of a separate offending style.

Another important study, that does not examine the behavioural structure of rape, but instead describes the verbal behaviour exhibited within the offence, is Dale et al., (1997).[22] The researchers examined the speech of 252 rape cases, committed by 55 offenders drawn from police records from the London area, as well as others within the UK. Dale et al., (1997) found rapists' speech could be examined sequentially and that different verbal strategies were used within the stages of 'Approach', 'Maintenance', and 'Closure.' Aspects within the Approach stage included strategies such as the 'Do As I Say' technique, which included directive speech such as 'Orders', 'Requests', 'Advice', 'The giving of permission', and 'Specific uses of questions.' An alternative approach tactic was the 'Foot In Door' strategy (as first established by Stahelski & Patch, 1993, cited within Dale et al., 1997). This involved the offender trying to implement a small act (such as touching) in order to gain compliance for a bigger act (the rape). Particular types of such verbal behaviour included reassurance and the lessening of the threat, reassurance and lying tactics, reassurance and bargaining with the

[22] It is acknowledged that other, very useful examinations of rapists' verbal behaviour have been carried out in recent years (such as Woodhams & Grant, 2006 and Lawrence, Fossi, & Clarke, 2010). Future research could explore the applicability of these systems using this sample.

victim, negotiating or trying to build a 'contract' with the victim. 'Door In face' strategies were also adopted; these involved carrying out a larger act (such as sexually assaulting the victim on approach) and then 'back-tracking' (Dale et al., 1997, p.662).

Strategies involved in the Maintenance stage of the crime included asking both sexual and non-sexual questions, replying to the victim's questions, disclosing personal information to the victim (of which some were lies), scripting (telling the victim what to say, what to do), announcing his intentions, and complimenting the victim. Lastly, at the Closure stage, offenders would often apologise to the victims, excuse their actions by telling sad stories and generally protesting that they could not help but rape the victim, and justifying their actions (by generally not acknowledging that they had done anything wrong).

The studies examined above will be used within this present chapter to both examine the offence behaviours exhibited within the stranger rapes and guide the present author in terms of considering the possible structural nature of the rapes. Firstly, however, it is important to examine the recurring behavioural themes that have been derived within the studies outlined above, alongside their relevance to psychological theory on rape behaviour.

5.1.2.2 Recurring behavioural themes

5.1.2.2.1 Criminal behaviours

Previous behavioural research has found evidence for the existence of behaviours that are essentially 'criminal.' For example, Canter and Heritage (1990)'s Criminality theme, Davies (1992)'s Modus Operandi aspect, Alison and Stein (2001)'s Dominance theme, Canter et al., (2003)'s Theft and Control themes and Häkkänen et al., (2004)'s Theft theme. Thus, researchers are finding that offenders are exhibiting a style that includes 1) behaviours such as stealing items, or ordering the victim to give him goods, 2) behaviours that indicate that the offender is trying to control the victim (such as gagging and blindfolding) and 3) behaviours that may be indicative of forensic awareness (such as the use of a condom, a disguise, wearing gloves, destroying semen). At a practical level, the latter behaviours may be indicative of someone who has knowledge of the police procedures (Beauregard & Bouchard, 2010) or tries as much as possible to complete a 'successful' rape (for example, by using controlling techniques, the offender can subdue the victim so that she does not make any noise).

Theoretical models of rape may also help to explain the exhibition of such behaviour. In terms of control, feminist theorists have postulated that males rape as a result of the need to punish and control women (for example, Brownmiller, 1975). They dismiss biological

theories of rape and claim that rape is a result of male domination in our society, rather than uncontrollable sexual urges. At an individual level, feminists believe that males rape because their masculinity is at risk; at a societal level, others argue that rape exists to ensure that there remains an unequal balance of power between men and women and that women should, therefore, be subjugated. The feminist Brownmiller (1975) insists 'it is nothing more or less than a conscious process of intimidation by which all *men* keep all *women* in a state of fear' (p5). Although an ideological and controversial view-point, models based on motivational theories of rape behaviour do emphasise that some rapists may have a need for power and control (for example, Groth, 1969).

Other theoretical models may also help to explain the exhibition of 'criminal' behaviours. Bartol (1986) emphasised that some criminal behaviour was driven by an instrumental motives. Therefore, some offenders may commit offences with the ultimate goal material items such as money. Therefore, some offenders may be motivated to steal and may rape as a secondary reward. Scully and Marolla (1985) found that some offenders, whilst commissioning another crime decided to rape a victim as an 'added bonus.' They describe how some rapists will take the opportunity to rape whilst burgling a house or robbing a supermarket; this is illustrated by one offender who admits, '"I decided to rape her to prove I had guts. She was just there. It could have been anybody"' (Scully & Marolla, 1985, p257).

It is noted that, in some behavioural research, 'theft' and 'control' behaviours are often separated into different themes (for example, Canter et al., 2003). However, in other studies, these have been shown to be within one region (for example, Häkkänen et al., 2004).

5.1.2.2.2 Sexual behaviours

Behaviours which share a 'sexual' nature have also been found within behavioural studies. For example, Canter and Heritage (1990) and Davies (1992) found or explained two separate regions of Sexuality and Intimacy, and Sexual and Personal gratification and Attitude and Intimacy respectively. These themes have been found to be one and the same within Canter et al., (2003)'s and Häkkänen et al., (2004)'s Involvement themes. Thus researchers are finding behaviours that, 1) show that the offender is trying to establish some kind of 'pseudo-relationship' with the victim and, 2) that the offender is striving for sexual gratification.

Theoretical models can be used to explain both of these aspects of the behaviours. Developmental models, assert that rape occurs as a result of inadequate bonding within childhood. Based in Bowlby's (1952) ideas of maternal deprivation and attachment, this

theory suggests that rape occurs because as a child, the offender does not form a close, 'healthy' bond with their mother, at a crucial point in their development. Therefore, as an adult, the offender is unable to form normal relationships with peers and potential partners and thus has to rape in order to gain intimacy and to satisfy a desire for social contact (Marshall, 1989). This theory is supported by evidence that some rapists do score highly on measures of intimacy deficits and loneliness (Seidman, Marshall, Hudson, & Robertson, 1994).

Motivational models of rape behaviour also emphasise the notion that offenders seek to satisfy their sexual urges within rape. Early, clinical classification systems, such as Cohen et al., (1969) argue that some offenders rape in order to act out rape fantasies and to alleviate feelings of sexual inadequacy (Compensatory rapists), whilst other rapists do so in order to gain sadistic pleasure from the offence (Sex-Aggression Diffusion rapists.

5.1.2.2.3 Violent behaviours

Lastly, behavioural models have found evidence for violent behavioural themes within stranger rape. For example, Canter and Heritage (1990) found both a Violence and an Impersonal theme, whilst parts of Davies (1992)'s Sexual and Personal gratification aspects related to the offender acting aggressively towards the victim. Alison and Stein (2001), Canter et al., (2003), and Häkkänen et al., (2004) all showed Hostility regions. Behaviours all seem to indicate that the offender is expressing high levels of aggression within the offence.

Again, theoretical models of aggression may help us to understand the types of behaviour exhibited within the offences. Bartol (1986) also suggested that some crimes occur due to offender's need to vent frustration or expressive anger (Feshbach, 1964). This has also been suggested within motivational models of rape behaviour, such as Cohen et al., (1969) and Groth (1969). Cohen et al., (1969) postulated that some rapists could be classified as 'Displaced Aggressive' rapists and that they raped victims in order to alleviate anger against a significant other victim. Groth (1979) also placed emphasis on this and described the 'Anger-Retaliation' rapist who feels generalised aggression towards a woman and will therefore rape in order to retaliate.

5.1.3 Rationale and research questions

The present chapter offers a detailed examination of the verbal and non-verbal offence behaviours exhibited within the offences. This is to create a picture of such actions within the rape and to compare the levels of particular behaviours against other descriptive and

behavioural studies. In response to the argument that offence behaviour should be examined as themes in order to understand the empirical underlying structures that they might represent (Canter, 2000), the present study examines whether the offence can be differentiated into the themes outlined within similar studies. In summary, the aims of this chapter are to:

- Provide a detailed examination of the levels of offence behaviour within the stranger rape sample
- Examine whether the offence behaviours can be differentiated into themes; namely, Criminal, Sexual or Violent themes.

5.2 Method

5.2.1 Sample

The 112 victim statements derived from the Stranger rape sample recorded on the Metropolitan Police Service's Crime Recording Information System (CRIS) were used within this chapter. These offences were committed between May 2004 and December 2006 and had been committed by 131 offenders against 114 victims. Data recording issues (as described in Chapter Two) meant that the length of the victim statements varied. For some offences, there was more than one account of the offence by the victim; for example, this could include a statement taken when the victim came into initial contact with a police officer, an initial interview with Sexual Offence Investigation Techniques Trained Officer (SOIT), and transcripts from the Achieving Best Evidence (ABE) interview (a video-taped interview). In other cases, only the initial interview was recorded in on the CRIS record. The drawbacks of this as a source of data for analysis have previously been discussed. However, the 112 victim statements remain the main source of information for the analysis carried out within this chapter.

If there were any discrepancies found in cases where there was more than one version of events, the researcher (and coders used in the inter-reliability analysis, see below) used the last version of the offence recorded. This method was chosen as this version was likely to be the most detailed, or the account for which clarification had been sought from interviewing officer.

The 114 victims' ages ranged from 13 to 75 (M = 26.4 years, SD = 14.0 years); over three quarters of the victims were aged 30 or under (77.2%). According to the Metropolitan Police Service's ethnic appearance codes, 70.2% of victims were described as 'White European', 18.4% Afro-Caribbean, 4.4% Asian and 8.2% were described as 'Other.'

5.2.2 Procedure

Similar to the procedure outlined in Chapter Four, each victim statement was examined and extracts relating to the offence behaviour exhibited by the offender were identified. These were defined as being any verbal or non-verbal behaviour (excluding any movements from one place to another) that the offender used from the initial encounter until the offender left the scene. This included behaviours that the victim explicitly stated did *not* happen (for example, the offender did not ejaculate in the extract below). These were underlined within the text but were not taken out the main body of the statement so as to preserve contextual background to the narrative (Braun & Clarke, 2006). An example of this method is as follows:

"Victim stated that she was walking home from a friend's house; she had crossed over ADDRESS and had entered the alleyway by the LOCATION pub when she looked around to see that the suspect was following her. She stopped to let him pass as she felt uneasy with someone behind her when he grabbed her and pulled a knife from his clothing. The alleyway has a cross roads in it and he pushed her down the left fork of the alleyway and pushed her to the ground and raped her (vagina). He then forced her to take his penis in her mouth and then turned her over and tried to rape her again (anally). The victim stated that the suspect did not ejaculate at all during the incident. The victim was then let go and the suspect said "If you tell anyone I'll come after you" The suspect made off down ADDRESS towards ADDRESS."

5.2.3 Analysis

5.2.3.1 Content analysis

Content analysis was used to derive the individual verbal and non-verbal behaviours exhibited by the offenders. Content analysis is the way in which "the researcher evaluates the frequency and saliency of particular words or phrases in a body of original text in order to identify key words or repeated ideas" (Namey et al., 2008, p.138). Thus, this method was used to identify the key offence behaviours exhibited by the offenders. As with the thematic analysis outlined in Chapter Four, the content analysis carried out by within this chapter was 'data driven' (Glaser & Strauss, 1967). The researcher read and re-read the victim statements, making notes about the behaviours exhibited within the statements before the content analysis was conducted (as suggested in Namey et al., 2008).

5.2.3.2 Development of the coding dictionary

From the initial examination of the victim statements, a content dictionary was developed which began to outline and define the behaviours, or variables that were shown in the stranger rapes. Although the initial content analysis method was considered 'inductive', the author was aware of the various studies, outlined in the Introduction, that had used a similar method of developing coding dictionaries for coding stranger rape offences (for example, Canter & Heritage, 1990; Davies et al., 1997; Alison & Stein, 2001; Canter et al., 2003; Häkkänen et al., 2004, Woodhams, 2008) Therefore, close examination of these coding dictionaries, alongside, helped define and develop the coding dictionary used in this study. This is a method used by other published studies, such as Canter et al., (2003) and Häkkänen et al., (2004).

Alongside the behaviours exhibited by the offender, other descriptive behaviours were identified. These were used to describe other important aspects of the offence that would have explanatory value and may have implications for the findings outlined in the Results section. These were: whether the offender had been disturbed and had to abandon the rape (the variable *Disturbed*), whether the offender was talking in a foreign language and, therefore, the victim may not have been able understand what he was saying (the variable *Foreign language*), whether there was more than one offender (the variable *Multiple offenders*), whether there was more than one victim (the variable *Multiple victims*), whether the victim was unable to hear what the offender was saying to her (the variable *No hear*), if the offender did not speak at all (the variable *No speech*) and whether the personal information given to the victim about himself was later verified to be a lie (the variable *Self-disclosure lie*).

From this process, 121 verbal and non-verbal behaviours alongside other descriptive variables were derived from the victim statements. These are shown and defined in within the original content dictionary in Appendix Eight.

Only behaviours that were specifically referred to and not implied were used. This is exemplified in the following example:

"The suspect tried to kiss the victim on the mouth. SUSPECT 1 then forced is penis into her vagina. She stated that she pushed him away."

In this, the offender has obviously taken his penis out of his trousers in order to penetrate the victim's vagina. Also, he has presumably put his penis back in his trousers before he "made off." However, as this is not explicitly detailed, it cannot be noted how and if the offender dressed or undressed himself.

5.2.3.3 Coding behaviours

After the original coding dictionary was developed, the behaviours were coded for frequency within each of the statements; these were coded dichotomously, based on whether the behaviour was present within each statement ('1') or absent ('0'). This unobtrusive method of analysing qualitative data is often used when coding police data that is not collected for research purposes. Previous studies have claimed that using non-dichotomous coding within the content analysis of police data could be unreliable (Canter & Heritage, 1990).

This coding process was carried out by the present author who is trained and experienced in this technique. Reliability of the coding dictionary was carried out by comparing the author's coding for each variable in comparison with the coding from two other trained researchers.

To test the reliability of the coding dictionary, a random sample of 12 cases (10% of the sample) were coded (for all variables) by the other two other researchers. This sample was derived using a function within the Statistical Package for Social Scientists (SPSS v.17). These two researchers were also trained and experience in content analysis through post-graduate and doctoral research training. Alongside this, the present author gave the further instructions 1) to clarify any ambiguous or contradictory information given within each statement by using the information within the last version given by the particular victim and 2) only to code for behaviour that was explicitly detailed (as described in Section 5.2.3.1). After the researchers had independently coded the 12 statements, a discussion was held to clarify any difficulties in understanding the definitions given for the variables (as Appendix Eight). Any ambiguous or unclear definitions were revised and the coders adjusted their coding results, if needed, accordingly.

Cohen's Kappa (Cohen, 1977) was used as a measurement to test the reliability of the three coding results. This is a measurement used in other studies that have used coding dictionaries (for example, Canter et al., 2003). As Fliess (1981) has suggested, values of 0.6 to 0.75 are considered 'good', whilst a Kappa values of above 0.75 are deemed 'excellent.' Therefore, only variables that had a Cohen's Kappa score of over 0.75 were used for within the final coding dictionary. The Cohen's Kappa scores for all the variables are shown in the original content dictionary in Appendix Eight.

This meant that the following variables were deleted due to low inter-rater reliability (in ascending order by their Cohen's Kappa score, given in parentheses); *Fondled* (0.47), *Positioned* (0.47), *Reassured* (0.67), *Redressed himself* (0.47), *Extended time* (0.67), *Ordered*

come (0.67), *Ran off* (0.67), *Ordered stay no move* (0.74), *Undressed victim* (0.67), *Walked off* (0.67); *Erection* (0.74), *Undressed himself* (0.74).

On discussion with the coders, it was discovered that the lack of agreement of the coding of *Fondled* was due to the extent to which the offender 'just' touched rather than stroked or fondled a part of the victim's body. One coder thought that it was difficult to determine, within the present sample, exactly what constituted sexual touching and what consisted non-sexual contact. Therefore, this variable was excluded from the subsequent analysis and the final coding dictionary.

The variable *Positioned* was thought to have a low inter-rater reliability due to the interpretation of the word 'positioned.' On discussing this low reliability with the coders, it was considered that one of them thought that this would mean that the offender would position the victim into a sexual position (for example, made her place her legs in a particular way), whilst the other coder thought that positioning someone was any kind of way in which the offender could move the victim around (for example, putting her on the ground) or forcing her to carry out a sexual act (such as pushing her head towards his penis). Because of lack of clarification of meaning of this variable in previous studies, it was decided that the definition within content dictionary to could not be refined in accordance to the low inter-rater reliability, and therefore, this variable was excluded from subsequent analysis.

The variables *Ran off* and *Walked off* both had low Kappa scores. This was thought to be due to the 'police' language used when recording the victims' statements. In some cases, the police officers would record that the suspect 'decamped', in others that the suspect 'left.' In both these cases, the speed of this behaviour was not explicitly described, leading to the researchers disagreeing on whether the offenders had walked or ran way.

Erection was also seen to have a low inter-reliability rate. This was also thought to be due to the method of recording. In some instances, the statements would refer to the offender having an erection, being "hard" or, alternatively, as not having an erection, such as the offender being "soft" or suffering from *Erectile dysfunction* (see Appendix Eight for a definition of this variable). In other cases, however, the victim would describe that penile penetration would occur, but did not explicitly say whether or not the offender had an erection. On discussion with the coders, it was decided that coding for *Erection* would not be an accurate assessment of whether or not the behaviour had actually occurred.

The variables *Undressed himself, Undressed victim*, and *Redressed himself* all had reliability scores lower than 'excellent.' For the reasons discussed in Section 5.2.3.1, it is thought that this was because the statements did not always explicitly detail whether the

offender had undressed himself or the victim. It was assumed that this was the case in many of the offences (as, for example, penetration could not fully occur without the offender and victim having had some of their clothes removed. Although the instructions given to the coders detailed how only explicitly detailed behaviours should be coded for, the coders agreed, as with Erection, that any coding of these variables would not give an accurate frequency of these behaviours.

Ordered come and *Ordered stay no move* were other variables that had lower than desired inter-rater reliability. It is thought that this was because of the range of language the offender used to order the victim to move or not to move. On discussion with the coders, it was thought that there was a lack of agreement here because there was too many ways in which the offender did this; by telling her to come with him, or to come over to him and so on.

The variable *Extended time* also yielded only a 'good' agreement. The coders felt that this was due to lack of clarification about how long after the offence this period should be. For example, if the offender raped the victim at his house and then, after this, cooked her dinner and made her watch television for hours, this could be coded for *Extended time* quite easily. However, if the offender raped the victim and then sat with her whilst she got dressed, the coders could not agree as to whether he was extending his time with her, as much as the former example. One of the coders felt that these two examples could both be measuring the offenders' desire to establish a 'pseudo-intimate' relationship with the victim; the other thought that this behaviour showed this in the former example but not in the latter. Therefore, and as the variable did not have an excellent inter-rater reliability score, it was decided not to include this variable in the analysis or subsequent iteration of the content dictionary.

Lastly, the variable *Reassured* only yielded 'good' inter-rater reliability. This variable included the offender offering the victim a contract (an offer in return for an action), by 'playing down' his actions (for example, "don't worry"), by telling her he would not hurt her if she did what he told her to do or by lying to her about his intentions. On discussion with the coders, it was thought that, in some cases, the coder thought that the latter example of reassurance was, instead, an implied threat. Examples if this included "if she let him have sex with her he would let her go", "do this and we'll let you go", if you do this, I will go, "give me a kiss and I'll go away", just let me enter you, I'll pull out I promise, and I won't do anything if you give me some money." Disagreement about this, and the less than excellent inter-rater reliability led to the variable being left out of the final coding dictionary.

It should also be note the inter-rater reliability for the variable *Self-disclosure lie* was unable to be calculated. Due to data protection and to preserve the confidentiality of the data because the coders were not allowed to know the real background details of the offenders (name, age and so on). However, this variable was not excluded from the frequency analysis in the Results section because this information is useful to know. It is excluded from the subsequent Smallest Space Analysis for reasons outlined in the next section.

In summary, therefore, 12 variables were excluded from the final coding dictionary and the subsequent analysis due to less than 'excellent' inter-rater reliability score.

The Cohen's Kappa scores of the remaining 109 variables (excluding *Self-disclosure lie* variable) were deemed excellent (M = 0.99, $S.D$ = 0.04, Mdn = 1.00, Min = 0.77, Max = 1.00).

The final coding dictionary describing the 109 variables derived from the sample are shown in Appendix Nine.

5.2.3.4 Variables for use in the Smallest Space Analysis

Before the offence variables could be examined using Smallest Space Analysis (see below), the number of variables were reduced. The exclusion of variables and the reasons why this was carried out is described below.

Firstly, there were five variables within the list that were not behavioural but were useful in terms of explaining other elements of the rape. For example, whether the offender spoke in a foreign language or the victim could not hear what he was saying has implications in terms of the interpretation or omission of particular elements of the offence. Also, if the offender was disturbed by a witness or a noise, this may have implications in terms of what he was able to do in the rape. These also included variables that more readily described the offender and victim characteristics that are important to note but do not directly relate to the offence behaviour directly observed by the victim. These were *Multiple victims* and *Multiple offenders*. In total, the five variables *Foreign language*, *No hear*, *Disturbed*, *Multiple victims* and *Multiple offenders* were excluded from the SSA analysis.

Secondly, there were seven variables that had overlapping meaning. For example, whether the approach method adopted by the offender was a *Confidence*, *Surprise* or *Blitz* attack overlapped with variables that described the behaviours that were shown in within these styles. For example, within a *Confidence* approach, an offender may have complimented or been inquisitive. Within a *Surprise* attack, the offender may have used a type of control violence, like pulling or kicking the victim. Within a *Blitz* attack, the offender

would have used overwhelming excessive force to overpower the victim, therefore exhibiting physical violence. These were not, therefore used within the SSA analysis. In some studies (for example, Canter et al., 2003) the researchers consider just one of these methods of approaches. This is because SSAs should not have mutually exclusive variables within them (that is, the offender will either use a confidence, a surprise or a blitz approach, but will not use these together). If the present study was to use these methods within the SSA, then one of these variables would be used. However, because of the reasons outlined (that is, the variables overlap each other), none of these variables were used. Also, *Conditional threat* and *Unconditional threat* were not used because they overlapped with the threat variables; there had to be a threat in the first place for it to be conditional or unconditional. Also, *Multiple penetration* was excluded because there had to be an attempt at a penetration or an achieved penetration for there to be more than one. Although these offences are classified on the premise that the offender is intent on raping the victim, this does not always happen. For these reason, *Multiple violence* was also excluded from the SSA. Therefore, these seven variables that were not included because they overlapped with other variables (*Blitz* was also not included because of low frequency, see below).

Thirdly, the variable *Self-disclosure lie* was not included because its reliability could not be determined.

Lastly, 50 variables were excluded due to their relative low frequency within the sample. Previous studies using Smallest Space Analysis to examine rape behaviours have used cases to variable ratio of at least 2:1 (Alison & Stein, 2001 and Canter et al., 2003 were over 4:1; Canter & Heritage, 1990 and Häkkänen et al., 2004 were over 2:1). The only exception to this was shown in Greenhall and West (2007), where they presented a ratio of cases to variables of 1.7:1. It is thought that it is 'better' to have at least twice the number of cases to variables as SSA's use correlations as the basis as their analysis. Therefore, there may be problems with the way the variance can work if there are more variables than cases (Professor I. Donald, personal communication, 21 February 2011). Therefore, as there was less than twice the number of offences to variables at this point of the analysis, it was decided that all variables that were present in less than 5% of the cases would be excluded. Previous studies have excluded rare behaviours that have occurred in between 1% (Häkkänen et al., 2004) and 10% (Woodhams, 2008) of cases. Five percent was used as the most appropriate level so that it would reduce the number of variables enough, but would not exclude other potentially useful variables.

The following variables were therefore excluded from the Smallest Space Analysis due to being present in less than 5% of cases; *Alcohol drank, Allowed to leave, Anal digital, Attracted attention, Blindfolded hand, Boasted, Bound, Cared liked loved, Cleaned teeth, Commented offender sexual arousal, Commented on own performance, Commented penis, Cunnilingus, Directed co-offender, Drugs smoked, Endearment term, Gloves, Hair covered, Held hand, Joked or laughed, Left weapon, Liar, Look out, Made phone call, Marry, Meet up, Non-alcoholic drank, No speech, Observed, Offered assistance, Offered pay, Ordered comment non-sexual, Ordered comment sexual, Phone smashed wires cut, Placed pad, Redressed victim, Requested help, Scripting verbal, Slept, Spat, Spat hand, Stole underwear, Swallowed, Switched lights off, Talked to himself, Taxi called, Television radio, Testicles in mouth, Torch, Vagina washed or cleaned*.

This left 46 variables that were used within the Smallest Space Analysis, yielding a ratio of cases to variables of over 2:1. The variables used within the SSA-1 are defined within Appendix 10.

5.2.3.5 Smallest Space Analysis

To test whether the offence behaviours could be differentiated into the hypothesised themes, the statistical technique of Smallest Space Analysis (SSA-1, Lingoes, 1973), a multivariate data reduction procedure, was conducted. The SSA was used to explore the co-occurrences of the rape behaviours and allowed for the testing of the hypothesis that the behaviours could be differentiated into themes. This could was performed on all 112 cases.

Smallest Space Analysis is a non-parametric multidimensional scaling (MDS) technique developed from Facet Theory (Guttman, 1979) that graphically represents the relationship between variables. MDS procedures such as SSA have been used to guide exploratory research within the social sciences, reformulating existing theory and creating new directions in research. Such techniques have been used within research to classify behaviours within a wide range of crimes including rape (e.g. Canter et al., 2003; Canter & Heritage, 1990) and sexual homicide (Salfati & Canter, 1999).

The Hebrew University Data Analysis Package (HUDAP, v.5.0) (Amar, 2005) was used to carry out the SSAs within the present study. Essentially, it calculates correlation coefficients between variables within a data matrix and places these values into a rank order. The matrix is changed into an association matrix, consisting of the correlation coefficients. These can then be represented as points in space where the rank order of correlations are inversely proportional to the rank ordering of distances between points. The computer

software performs a series of iterations on the distances between points to best reflect the rank order of correlations. A ‘coefficient of alienation’ (Borg & Lingoes, 1987) is produced to measure the goodness of fit of the representation and indicates how well the co-occurrences in the association matrix are represented in the spatial illustration. In general, there is not a standard answer as to the ‘best’ value for the coefficient as this depends on various alternative calculations (Borg & Lingoes, 1987). In general, “the smaller the coefficient of alienation is, the better the fit” (Canter & Heritage, 1999, p.193); however, the interpretation of the inter-relationships between the variables, and thus the empirical structure of the plot, is key (Laumann & Guttman, 1966).

The SSA structure can be examined in terms of any spatial contiguity that may occur. As SSA is “based upon the assumption that underlying structure, or system of behaviour, will most readily be appreciated if the relationship between every variable and every other variable is examined” (Canter & Heritage, 1990, p.192), variables shown closer together on a graphical representation will share similarities in some underlying empirical structure. Thus, SSA was used to examine the co-occurrence of the offence behaviours within the sample; variables that occurred in within particular regions in the plot were considered to represent a similar underlying structure. Usually, behaviours can be partitioned within different areas on an SSA plot, which are said to relate to various psychological themes

Once themes within the plot were identified, Kuder-Richardson 20 (K-R 20) scores (Kuder & Richardson, 1937) were calculated to measure the internal reliability of each region. This is thought to be a similar measure as Cohen’s Kappa but for use within dichotomous data (Canter, et al., 2003).

In summary, the present chapter aimed to examine the offence behaviours that were exhibited in the 112 stranger rape offences. Content analysis was employed to derive a coding dictionary of reliable variables. The frequency of these variables was calculated, alongside examples within the text. Variables that did not overlap with other variables, were exhibited by the offender, and were present in more than 5% of the cases were put into a Smallest Space Analysis. This was used to examine any underlying, empirical structure to the data and to see whether the offence behaviours could be differentiated into themes.

5.2.4 Hypothesised regions

The main aim of this chapter centre on the expectation that the offence behaviours used within the Smallest Space Analysis will form particular regions within the plot. This is a similar overall aim as Canter et al., (2003). As detailed in this chapter’s introduction,

recurring behavioural themes within past research include those which are criminal, those which are sexual and those that are violent. It is predicted therefore, that the SSA presented here will be differentiated into these three themes and that these themes will consist of particular behaviours. Table 5.2.4 outlines the theme in which the behaviours are predicted to fall. *Tobacco smoked* which is novel and therefore, it is not known within which theme this variable will be found. Therefore, this is the only variable where a prediction is not made.

Table 5.2.4: Hypothesised regions within which the offence behaviours are expected to lie

Core variables	
Control violence	It was predicted that this variable would be a core variable within the plot due to its high frequency.
Vaginal penile	Canter and Heritage (1990), Canter (1994) and Canter et al., (2003) found that this was a core variable within the SSA plot.
Criminal theme	
Behaviour	**Reason for prediction**
Blindfolded material	Alison and Stein (2001) found this within their Dominance theme, whilst Canter et al., (2001) and Häkkänen et al., (2004) both found this within their Control theme. Canter and Heritage (1990) found this within their Criminal behaviour and Intent theme.
Condom	This was found within the Theft theme in Häkkänen et al., (2004) and described under the Modus Operandi category in Davies (1992).
Disguise	Alison and Stein (2001) found this within their Dominance theme, Canter et al., (2001) within their Control theme. Canter and Heritage (1990) found this within their Criminal behaviour and Intent theme. Davies (1992) categorised this was within the Modus Operandi theme.
Gagged hand	Gagging was found within Dominance theme in Alison and Stein (2001), the Control theme in Canter et al., (2003), the Theft theme in Häkkänen et al., (2004) and Criminal behaviour and Intent within Canter and Heritage (1990).
Locked in	This has not been directly measured in behavioural studies; however, as it is an aspect of the crime that is non-sexual, relates to controlling the victim and ensuring the offender has a safe escape, it is predicted that this will fall into a Criminal theme.
Ordered no noise	Woodhams (2008) both categorised this variable as within an Escape domain.
Ordered no report	Alison and Stein (2001) found this within their Dominance theme, whilst Canter et al., (2001) found this within their Control theme. Davies (1992) categorised this was within the Modus Operandi theme.
Ordered property	Alison and Stein (2001) found ‘demanding goods’ to fall within their Dominance theme; Canter et al., (2003) found this within their Theft theme; Canter and Heritage (1990) found this within their Criminal behaviour and Intent theme.
Ordered wait escape	Again, this has not been directly measured in behavioural studies; however, as it is an aspect of the crime that is non-sexual, and ensures the offender has a safe escape, it is predicted that this will fall into a Criminal theme.
Rummaged	Häkkänen et al., (2004) found this within the Theft theme.
Stole property	Canter et al., (2003) and Häkkänen et al., (2004) found this within their Theft themes; Canter and Heritage (1990) found this within their Criminal behaviour and Intent theme.

Table 5.2.4: Hypothesised regions within which the offence behaviours are expected to lie (continued)

Criminal theme	
Behaviour	Reason for prediction
Weapon from scene	Alison and Stein (2001) found the use of weapons within their Dominance theme, whilst Canter et al., (2001) found the use of weapons within their Control theme. Canter and Heritage (1990) found weapons within their Criminal behaviour and Intent theme.
Weapon to scene	Alison and Stein (2001) found this to fall within their Dominance theme; Canter et al., (2003) found this within their Control theme; Canter and Heritage (1990) found this within their Criminal behaviour and Intent theme.
Sexual theme	
Behaviour	Reason for prediction
Apologised	Greenhall and West (2007) found this to be within their Sexual region, Alison and Stein (2001) within the Compliance-giving region and Häkkänen et al., (2004) within the Involvement region.
Breasts	Fondled is found within the Compliance theme within Alison and Stein (2001) and within the Sex domain of Grubin et al., (2001).
Complimented	This is found within the Compliance-giving region of Alison and Stein (2001), Involvement in both Canter et al., (2003) and Häkkänen et al., (2004) and categorised within Attitude and Intimacy (Compliments) in Davies (1992).
Cuddled	Affection expressed or required is categorised within the Attitude or Intimacy aspect within Davies (1992). Hugged is categorised within the Style domain within Woodhams (2008).
Ejaculated	Davies (1992) categorised this within Sexual and Personal Gratification (Sexual acts); Grubin et al., (2001) found this within the Sex domain.
Erectile dysfunction	This was found within the Sex domain in Grubin et al., (2001) and categorised within Sexual and Personal gratification (sexual problems) within Davies (1992).
Excused or justified	Grubin et al., (1992) categorised excuses within the 'Style' domain, whilst Davies (1992) listed excuses as Attitude and Intimacy under (Excuses or apologies).
Fellatio	There have been differing results for where fellatio sits within themes; Alison and Stein (2001), Canter et al., (2003) and Häkkänen et al., (2004) have all found this within their Hostility themes. However, Canter and Heritage (1990) found this within their Sexual behaviour theme and Davies (1992) categorised this within Sexual and Personal Gratification (Sexual acts). It could be, therefore that this variable may be in either theme.
Implied knowing	This was found within the Compliance-giving region of Alison and Stein (2001) and within the Involvement regions of Canter et al., (2003) and Häkkänen et al., (2004).

Table 5.2.4: Hypothesised regions within which the offence behaviours are expected to lie (continued)

Sexual theme	
Behaviour	Reason for prediction
Kissed	Alison and Stein (2001) found this to be within their Compliance-giving region; Canter et al., (2003) and Häkkänen et al., (2004) both found these to be in Involvement themes. Davies (1992) categorised this within Sexual and Personal Gratification (Sexual acts).
Masturbated hand	Häkkänen et al., (2004) found this within their Involvement theme. Grubin et al., (2001) categorised this within the Sex domain and Davies (1992) described this as within the Sexual and Personal Gratification (Sexual Verbal themes).
Non sexual questions	Alison and Stein (2001) found this within their Compliance-giving theme; Häkkänen et al., (2004) within the Involvement theme; Davies (1992) categorised this within Attitude and Intimacy (within Curiosity).
Ordered redress	It is predicted that this variable will be found within the Sexual theme as is *Order undressed*.
Ordered sexual activity	Woodhams (2008) categorised this within the Sex category; Davies (1992) framed this within the Sexual and Personal gratification aspect of behaviour under Sexual acts (performed, attempted, requested or mentioned)
Ordered undress	Grubin et al., (2001) and Woodhams (2008) categorised this behaviour within Sex domains.
Penis testicles pubic hair touched	Forcing the victim to perform a specific act was found within Hostility regions in Alison and Stein (2001), Canter et al., (2003) and Häkkänen et al., (2004). However, it seemed more appropriate to predict that this variable should be included in the Sexual theme because these behaviours included stroking and fondling rather than more aggressive acts.
Sat or laid beside victim	It is predicted that this will fall into the *Sexual* theme because of its pseudo-intimate nature.
Self-disclosure criminal	Alison and Stein (2001) found this within their Compliance-giving theme; Canter et al., (2003) and Häkkänen et al., (2004) within Involvement themes; Davies (1992) categorised this within Attitude and Intimacy (within Self-disclosure).
Self-disclosure personal	Alison and Stein (2001) found this within their Compliance-giving theme; Canter et al., (2003) and Häkkänen et al., (2004) within Involvement themes; Davies (1992) categorised this within Attitude and Intimacy (within Self-disclosure).
Sexual questions	Grubin et al., (2001) found this within their Style domain, whilst Davies (1992) categorised this within Sexual and Personal Gratification (sexual verbal themes)
Vaginal digital	Davies (1992) categorised this within Sexual and Personal Gratification (Sexual acts); Grubin et al., (2001) found this within the Sex domain.
Victim arousal	Offender sexual comment is categorised within Alison and Stein (2001) as Compliance-giving, within Canter et al., (2003) and Häkkänen et al., (2004)'s Involvement theme and categorised as Sexual and Personal gratification (sexual verbal themes) within Davies (1992).

Table 5.2.4: Hypothesised regions within which the offence behaviours are expected to lie (continued)

Violent theme	
Behaviour	Reason for prediction
Anal penile	Alison and Stein (2001) and Canter et al., (2003) found this to fall within their Hostility region.
Bit	Häkkänen et al., (2004) found this to lie within their Hostility region whilst Greenhall and West (2007) found this to fall within their Violent attacks.
Physical violence	Alison and Stein (2001), Canter et al., (2003) and Häkkänen et al., (2004) all found this behaviour within a Hostility theme. Canter and Heritage (1990) found it within their Overt Violence and Aggression region, whilst Greenhall and West (2007) within their Violent attack region.
Threatened physical violence	Alison and Stein (2001), Canter et al., (2003) and Häkkänen et al., (2004) all found this behaviour within a Hostility theme. Canter and Heritage (1990) found it within their Overt Violence and Aggression region, whilst Greenhall and West (2007) within their Violent attack region.
Threatened weapon	Häkkänen et al., (2004) found this to lie within their Hostility region.
Tore clothing	Alison and Stein (2001) and Canter et al., (2003) found this to fall within their Hostility region.
Verbal abuse	Alison and Stein (2001) and Canter and Heritage (1990) found demeaning language to be within their Hostility theme. Canter and Heritage (1990) found insulting language to be within their Overt Violence and Aggression region.

5.3 Results

5.3.1 Percentages of behaviours

Table 5.3.1 shows the percentage of each of the 109 behaviours (verbal, non-verbal) present in the sample. Each of the behaviours is discussed below, alongside comparisons with previous literature on ‘one-off’ (as opposed to serial) rapes.

Table 5.3.1: Percentage of offence behaviours within the sample (N = 112)

Behaviour	Percentage
Control violence	86.6
Vaginal penile	71.4
Confidence approach	54.5
Ordered sexual activity	50.0
Multiple penetrations	49.1
Surprise approach	44.6
Conditional threat	42.9
Fellatio	42.9
Ordered no noise	42.0
Stole property	40.2
Kissed	35.7

Table 5.3.1: Percentage of offence behaviours within the sample (*N* = 112)

(continued)

Behaviour	Percentage
Physical violence	33.9
Threatened physical violence	33.9
Ejaculated	33.0
Self-disclosure personal	28.6
Multiple acts of violence	25.9
Weapon to scene	25.9
Ordered property	25.0
Verbal abuse	25.0
Disturbed	24.1
Threatened weapon	20.5
Unconditional threat	20.5
Anal penile	19.6
Non sexual questions	19.6
Ordered undress	17.9
Vaginal digital	17.0
Gagged hand	16.1
Condom	14.3
Rummaged	14.3
Ordered no report	13.4
Self-disclosure lie	13.4
Victim arousal	12.5
Multiple offenders	11.6
Ordered no look	10.7
Breasts	9.8
Complimented	9.8
Tore clothing	9.8
Blindfolded material	8.9
Erectile dysfunction	8.9
Locked in	8.9

Table 5.3.1: Percentage of offence behaviours within the sample (N = 112)

(continued)

Behaviour	Percentage
Ordered redress	8.9
Penis testicles pubic hair touched	8.9
Cuddled	8.0
Implied knowing	7.1
Self-disclosure criminal	7.1
Ordered wait escape	6.2
Weapon from scene	6.2
Sexual questions	6.2
Apologised	5.4
Bit	5.4
Disguise	5.4
Excused or justified	5.4
Foreign language	5.4
Masturbated hand	5.4
Sat or laid beside victim	5.4
Tobacco smoked	5.4
Alcohol drank	4.5
Blindfolded hand	4.5
Bound	4.5
Endearment term	4.5
Joked or laughed	4.5
Non-alcoholic drank	4.5
Offered assistance	4.5
Television radio	4.5
Cared liked loved	3.6
Commented offender sexual arousal	3.6
Directed co-offender	3.6
Held hand	3.6
Liar	3.6
Redressed victim	3.6

Table 5.3.1: Percentage of offence behaviours within the sample (*N* = 112)

(continued)

Behaviour	Percentage
Talked to himself	3.6
Allowed to leave	2.7
Anal digital	2.7
Attracted attention	2.7
Boasted	2.7
Commented penis	2.7
Drugs smoked	2.7
Gloves	2.7
Left weapon	2.7
Made phone call	2.7
No hear	2.7
Ordered comment sexual	2.7
Placed pad	2.7
Swallowed	2.7
Testicles in mouth	2.7
Scripting verbal	2.7
Vagina washed or cleaned	2.7
Cunnilingus	1.8
Phone smashed wires cut	1.8
Meet up	1.8
Multiple victims	1.8
No speech	1.8
Slept	1.8
Switched lights off	1.8
Taxi called	1.8
Torch	1.8
Blitz approach	0.9
Cleaned teeth	0.9
Commented on own performance	0.9
Hair covered	0.9

Table 5.3.1: Percentage of offence behaviours within the sample (N = 112) (continued)

Behaviour	Percentage
Look out	0.9
Marry	0.9
Observed	0.9
Offered pay	0.9
Ordered comment non-sexual	0.9
Spat	0.9
Spat hand	0.9
Stole underwear	0.9
Requested help	0.9

5.3.1.1 Control violence

The offender used acts of violence to control the victim in 86.6% of the sample (97 offences). This includes times when the offender dragged, grabbed, jumped on, pinned down, restrained arms, pulled (including victim's hair), pushed or tripped the victim. This were coded together as they all represented methods the offender adopted to overpower the victim, without the need for excessive violence. Greenhall and West (2007, p.158) described a similar variable and named this "minor acts of violence".

The victim described how she was grabbed in sixty cases. In most of these cases, the offender grabbed the victim at the beginning of the offence. This was usually by the arm or wrist, neck, mouth or waist. One offender grabbed the victim's bag and pulled her down by the strap. Other offenders grabbed the victim's clothing, such as their jacket or collar. Other victims described how their legs were grabbed whilst resisting the attack (kicking) or their arms were grabbed as they were running away. Finally, one victim retold how their hands were grabbed and placed on the offender's penis.

The offender pushed the victim in 51 cases and pulled the victim in 21 cases. Examples of these behaviours include the offender "pushing the victim to the ground", when he "pushed her into an alleyway", when one offender "pushed her against a white van" or when the offender "pulled her close to him" and "pulled her to the ground." (This does not include times when the offender "pulled" the victim's clothes off.)

The offender dragged the victim in 37 offences. In these cases, the victims described the offender has "dragging" them from one place to another, across the floor or ground by different parts of their body.

In 10 cases, the offender pulled the victim's hair. In six of these, the offender pulled the victim's hair in order to position her, either to make her move (one case) or to force her to fellate him. In two cases, the offender dragged the victim along the ground by her hair; whilst in another case, the offender was grabbing the victim's hair as part of a violent struggle. Lastly, one offender pulled the victim's hair to get her to "shut up."

In five cases (4.5%), the offender picked the victim up from the ground. On approach, one offender jumped on the back of the victim and, once she was on the floor, picked her up and carried her away. At the beginning of another offence, the offender approached the victim and picked her up from the ground and carried her to a nearby flat. Whilst within the flat, the victim also described how the offender carried her over his shoulder and carried her into a bedroom. In another offence, as the victim was pulled by the offender and she dragged her feet on the ground (making it difficult for him to get her from one place to another) the offender picked the victim up and carried her over to a bush. Lastly, another victim explains that, because of the height and strength difference between the offender and herself, once realising that the victim was making "too much noise", the offender lifted her off the ground and carried her to into a toilet, locking the door behind them.

Other forms of control violence included being jumped on (in two cases, the victim having described being jumped on from behind, on approach, by the offender); pinned down (two cases); tripped up (in one case, the offender tripped the victim over, by knocking her legs from under her, after having asked her the time).

Usually, behavioural studies on 'one-off' rape cases record violent acts that "are related to the violence itself rather than used as a form of control" (Häkkänen et al., 2004, p. 21). However, Greenhall and West (2007) measures acts such as "pushing and wrestling to the ground" and recorded these as "minor violence." In this study, however, the percentage of this behaviour was only 13% compared with the present sample's percentage of 86.6%. This may be due to two main factors. Firstly, the sample used within the Greenhall and West (2007) study were males who had been or were committed to one of three high secure hospitals. Therefore, they were deemed to be particularly 'dangerous' and, as Greenhall and West (2007, p.154) cite, the offenders were receiving '"treatment under conditions of high security on account of their dangerous, violent or criminal propensities"'(National Health Service Act 1977, as amended). It could be argued, therefore, that these offenders may have

used ‘more violent’ means within their offences (see ‘Physical Violence’ below) and their use of violence to restrain and control was not needed to subjugate their victims. Secondly, there is a slight variation in the way that Greenhall and West (2007) have coded their violent variables, compared with the present study. They have included pulling hair as an act of ‘actual violence’; whilst it was felt that this act was more of behaviour to control the victim in the present study, as explained in the above description.

Other work directly refers to this type of control violence. Woodhams (2008, p.324), for example, refers to “Instrumental violence” and explains this as “Offender is violent towards the victim to control her.” The author reports that this type of behaviour was recorded in 25.6% of her sample. Woodhams (2008) also reports levels of the behaviours of ‘Grab’ as 43.6%, ‘Restrain Body’ as 43.6% and ‘Restrains Arms’ as 12.8%. Again, this is a much lower percentage than the present study but may also reflect the differences in the nature of the samples. In Woodhams (2008, p.106), the “non-series stranger sex offenders” had all been convicted of the offence. As research shows, there is a relationship between level of injury and whether victims withdraw their allegation of rape; Feist et al., (2007, p.57) found that “uninjured” were “over-represented in withdrawn cases.” It could be argued, therefore, that if a conviction is secured, the likelihood that the offender used more excessive, injurious violence instead of control violence would be greater than if a conviction was not secured. Indeed, Harris and Grace (1999, p.13) reported that when “there was no evidence of any violence or injury to the complainant”, offences recorded to the police are often classified as ‘NFA’ (No Further Action). In summary, therefore, it may be that because the present study used recorded offences, rather than conviction data, there may be higher levels of violence as a means to control, rather than physical violence, than studies using data from convicted offenders.

5.3.1.2 Vaginal penile

The offender attempted to or achieved penetration with his penis in 80 cases (71.4%). This included both rear and front penetration. In some cases, this action was achieved, in others, the victim reported that offender tried to penetrate her vaginally but was either disturbed or could not achieve penetration (see *Erectile dysfunction*).

Previous literature suggests that vaginal penile penetration is present in at least more than 80% of cases considered. For example, Jones et al., (2004) recount that 94% of stranger rapes within their sample were vaginally penetrated, Canter et al., (2003) recount a percentage of 82% and whilst Canter and Heritage (1990) and Greenhall and West (2007)

report that 100% of their sample of offenders had vaginally penetrated their victims. In some cases, the behavioural studies split vaginal penile penetration in terms of whether the offender achieved penetration from the rear of the victim or facing her; for example, Häkkänen et al., 2004 describe how 89% of their sample were penetrated from the front, whilst 7% were penetrated from behind. Within the present study, it was found that this kind of detail was not necessarily recorded. Therefore, it was decided that this variable should be considered as covering both front and rear penetration.

The reason why the percentage of cases presenting with achieved or attempted vaginal penetration within the sample was lower than the cases cited above may be due to the change in the legal definition of rape. This has changed in UK since some of these studies were carried out (see Chapter Three). The present sample includes cases where attempted or achieved penetration of the victim's mouth or anus is the only penetration present. Because of this, these offences have been classified as rape. In previous years, rape would have just included vaginal penetration. Therefore, when drawing comparisons with the Canter et al., (2003) study, it is likely that the present study will have more cases of the other kinds of penetration and less vaginal penetration.

5.3.1.3 Confidence approach

The offender used a confidence approach in 61 cases (54.5%). This variable meant that the offender used some kind of verbal tactic to gain the victim's attention or confidence even for a short period of time. Studies of rape often record the style of approach used by the offender as either confidence, surprise or blitz approaches (see below). This distinction between the different styles of attacks was established by Burgess and Holstrom (1974), who suggested that in the confidence approach "the assailant uses deceit and false pretences to gain access to the victim and then violently betrays this trust" (Silverman, Kalick, Bowie, & Edbril, 1988).

Within the present sample, the offenders often asked the victims short questions to gain their attention. These included asking for the time, directions to a particular place, the victim's name, where the victim lived or if she had a partner. More 'casual' conversation was also used; the offender would attract the victim's attention by asking how they were, or where they had been that evening. Some offenders would give compliments to the victim on her physical appearance (for example, "hey sexy", "you're gorgeous." Tricks or acts of artifice were also used; four offenders knocked on the victim's door.

Previous research into rape behaviours has shown that the offenders adopt a confidence approach in 3.7% (Canter & Heritage, 1990) to 85% of offences (Ruperal, 2004). Some of the studies that adopt multidimensional scaling techniques do not use confidence approach within their Smallest Space Analysis, but instead use the alternatives to this, either the Surprise or Blitz approaches (for example, Häkkänen et al., 2004; Canter et al., 2003). This is because SSAs should not have variables that are mutually exclusive; most studies find that offenders either adopt a surprise, a confidence or a blitz approach at the beginning of their offence (Häkkänen et al., 2004 reported this but still disclosed that 75% of their rapes did include confidence approaches). There is contention whether offenders adopt only one of the approaches or a combination of two or three; an example of the latter is given within a study of group rape by Porter and Alison (2006). Here, they state that "These different approach methods are not mutually exclusive since an offender could, potentially, initially approach with a confidence trick but then suddenly surprise the victim with a weapon" (Porter & Alison, 2006, p.366). Within this study, the very first method of approach used within the rape was the one used for recording the frequency of confidence, surprise, and blitz attacks. [23]

The range of percentages denoting the use of a confidence approach shown in the different studies on rape may reflect the different sampling strategies or types of data used within these studies. The low percentage reflected in Canter and Heritage (1990) may be due to the selection criteria used within the study. As the authors state, the data was collected by requesting police forces to send examples of stranger rape for use in the study (Canter and Heritage, 1990, p.191). It could be that the police forces may have selected the most violent or most prominent in their records and, therefore, the offenders may have adopted a blitz or a surprise approach rather than a confidence one. The high percentage reflected in the Ruperal study may reflect the fact that all types of victim-offender relationships were examined for this (that is, stranger, acquaintance and intimate rapes). There is some evidence to support the notion that offenders who commit offences against acquaintances or intimates are significantly more likely to adopt a confidence approach than a surprise or blitz attack (Porter & Alison, 2006, although this study examined group rape). Therefore, the Ruperal (2004) percentage of 85% may reflect the higher proportion of crimes by 'known' offenders within

[23] When assessing the inter-rater reliability of the behaviours exhibited, lower Cohen's Kappa levels were seen when the approaches were considered non-mutually exclusive. Coders felt that all of the stranger rapes, at some point, could be surprise attacks as the offender would have to overpower the victim in order to rape her. An iteration of the coding dictionary refined the definitions of the three approaches to include only the initial method of approach used. This improved the inter-rater reliability of the categories.

the sample (strangers made up 37% of the sample; it is implied that the rest were perpetrated by acquaintances and other types of victim-offender relationships).

Other studies into the rape behaviour of adult sex offenders reflect percentages of confidence approaches in line with the present study. Silverman et al., (1998) found that out of 1000 victims who were seen at a rape crisis centre, 36.3% of victims had been subject to a confidence approach. Sturidsson, Långström, Grann, Sjöstedt, Åsgård and Aghede (2006) found that the figure was 43%, whilst Davies et al., (1997) found a similar figure of 48% of offences included a confidence approach. Lastly, and mirroring the results of the present study, Alison and Stein (2001) found that 52% of their non-serial rape offences contained a confidence attack. In summary, it seems that the present study reflects those found in recent research, using adult stranger offenders.

5.3.1.4 Ordered sexual activity

The offender ordered, requested or announced that the victim had to perform a sexual act or to have sexual intercourse with him in 66 cases (50.0%).

For the most part, this included the offender ordering the victim to perform fellatio on him and included the commands "suck me", "put this in your mouth", "go, go, go" (with penis in mouth), "suck" or "chew on this", "give me a blow job", "give me head", "kiss my dick", "go down." The offender also ordered the victim to be penetrated by him (but sometimes referring to this as "it.") Examples include "let me have it", and "do it." Particular aspects of this act are covered within this variable and in one instance, the offender ordered the victim to place his penis inside her. Other ordered sexual activity included forcing the victim to swallow his semen, to spit on his hand, to take his penis in her hand and to put his testicles in her mouth. These orders were often coupled with a conditional threat; for example, one offender ordered the victim to perform fellatio on him, otherwise she would be threatened with a weapon.

The only study that specifically describes the frequency of orders or commands by the offender for sexual activity is that of Woodhams (2008). Although this study primarily examined offenders who were juveniles, the author found that 35.9% of a sample of 39 non-serial offenders had directed the victim "to perform a sexual behaviour" (Woodhams, 2008, p.321). This is lower than the percentage found in the present study, but may be because the sample characteristics are different (that is, juvenile as opposed to adult offenders) and that Woodhams (2008) had a separate category for 'Disclosing intent.' Within this, the offender "discloses his intentions for subsequent behaviour" (Woodhams, 2008, p.323), which would

include cases where the offender would announce that he was going to rape the victim. Within the present study, these two verbal behaviours were considered within the variable of *Ordered sexual activity*. This is because it was thought that the announcements of sexual activity were framed as orders in some versions of the rape statements. To avoid confusion, and because the victim and the police officer seemed to be interpreting this announcement as an order, these two variables were considered as one.

Other studies found evidence of a similar variable of 'forced victim participation' and found frequencies of this from 18% (Häkkänen et al., 2004) to 66.6% (Canter & Heritage, 1990). This is not directly comparable to the present behaviour as this is usually defined as forcing the victim to participate physically in the attack (Canter & Heritage, 1990). Within the present study, this would include other demands or behaviours such as ordering the victim to position herself (denoted by the *Positioned* variable that was excluded for low inter-rater reliability). Also, the authors do not detail whether this forced actions was verbal or non-verbal.

Other authors explain the use of these orders or 'mands' to direct behaviour within the offence. Davies et al., (1997) cite Thomas, Bull and Roger (1982) who describe how these commands can be 'hard' or 'soft' orders and are a type of directive or regularity speech. Other variables described presently are examples of this type of verbal behaviour present in the data used here.

5.3.1.5 Multiple penetrations

The offender penetrated the victim in more than one orifice or the victim was penetrated by more than one offender in 55 cases (49.1%). In 13 of these cases, the victim was penetrated by more than one offender.

Only a few studies measure acts of multiple penetrations within rape offences. Within these, there is a large disparity between the frequencies of multiple acts of penetration; for example, Häkkänen et al., (2004) found that 6% of their sample was penetrated more than once, whilst Greenhall and West (2007) found that 51% of their sample had penetrated the victim on more than one occasion. This may be down to cultural differences (Finland versus the UK) or the nature of the data used within the study (police data versus data from those detained in a high-secure prison). The present study bears similarities in frequency to the Greenhall and West (2007) study, although this author recognises that this present sample includes a minority of multiple perpetrator rapes. It could be considered, therefore, that the

lone offenders within the present sample were less likely to penetrate their victims on multiple occasions compared with those within a high secure setting.

5.3.1.6 Surprise approach

The offender used a surprise approach in 50 offences (44.6%). In this instance, this style of attack is described as being an immediate show of physical force or control (as opposed to an immediate injurious force which would be a blitz attack). For this purpose, although a combination of styles of attack may have been used in these offences (and it is acknowledged, that in other studies offenders do sometimes use a mixture of styles (for example, Porter & Alison, 2006), in this study, the method of approach is the very first method that is used.

In some of these cases, the victim was grabbed, or another method of control was used. For example, one victim was pushed into her own house; others were attacked from behind, others were grabbed and dragged along the floor. One offender pulled the victim's jacket over her head; another pushed the victim against a wall. In some cases, the victim found the offender in their own house and the offender immediately overpowered them. In one of these, the victim awoke to find the offender on top of her; another awoke to find a hand over her face and was threatened with violence. On other occasions, the attack started as a robbery; one victim was approached from behind and was asked for her "stuff."

A weapon was also used or threatened in some surprise attacks. Often, the offender would approach the victim from behind, showed the victim a knife and told her to walk with him. More "passive" surprise approaches were also used. For example, the presence of the offender was an indirect act of control, such as the victim waking up to find an offender in their bedroom, demanding money.

As noted when considering the confidence approach, some studies consider the style of approach to mutually exclusive (Häkkänen et al., 2004); others show it is not always (Porter & Alison, 2006). Therefore, the findings from some studies may not be directly comparable to the present one. The range of percentages for a surprise approach range from 25% (Häkkänen et al., 2004) to 86.6% (Alison & Stein, 2001). The Häkkänen et al., (2004) study is almost half of that within the present study; it could be that this might be due to differences in culture or the settings within which the rapes arose. For reasons described in the Confidence approach section (that is, because she examined all types of victim-offender relationships), Ruperal (2004) also described a lower percentage of surprise attack (15%). The Alison and Stein (2001) study showed a higher percentage and this seemed to be down to

a difference in the definition of surprise attack. There, the authors described this as "An immediate attack on the victim, whether preceded by confidence or not, where force was used to control the victim" (Alison & Stein, 2001, p.537). Therefore, cases which the present study may have considered as having a confidence approach would have been categorised under surprise according to Alison and Stein (2001).

Canter et al., (2003) also report a higher percentage of surprise attacks, at 74%. It is thought that this might be because they did not use a category for a blitz attack and that this variable might be one and the same. Greenhall and West (2007) have found similar levels of a surprise attack within their sample (54%).

5.3.1.7 Conditional threat

The offender used a conditional threat in 48 cases (42.9%). This means that he ordered, asked or wanted the victim to behave in a particular way (see specific *Orders*) and that if she did not carry out that behaviour, he threatened her with violence (see the *Threatened physical violence* or *Threatened weapon, Threatened no report*). Therefore, when coding for conditional threats, there would also be the need to code for a particular order and a specific threat. Examples include direct conditional threats such as, "If you tell anyone I'll come after you", and one offender "threatening to kill her if she moved away." The sample also included the offenders using more implied conditional threat techniques such as "I will not hurt you if you do as I say" or "let me have it and I'll let you go." Davies et al., (1997, p.661) referred to these a form of "REASSURANCE + BARGAIN/IMPLIED THREATS", a type of 'Foot in door' technique (Stahleski & Patch, 1993). Within this sample, it was decided that these kinds of verbal strategies seemed more threatening than reassuring and therefore were placed in the conditional threat category. There are more examples of this type of threatening behaviour within the *Ordered* and *Threatened* variables

This variable was developed and used in the same way as Woodhams (2008). In this, she described how 33.3% of the non-serial offences committed by juvenile offenders had used this type of threat which "implies his aggression is conditional on the victim's behaviour" (p.323). The slightly higher percentage in the present sample may because of the difference in ages (*Mdn* = 28) of the offenders here compared with the Woodhams (2008) age (*Mdn* = 16). It could be that older offenders may use this strategy as a more 'sophisticated' why of getting the victim to behave (or not to behave) in a particular way, whilst younger offenders may not.

5.3.1.8 Fellatio

In 48 offences (42.9%), the victim was made to perform fellatio on the suspect. In 26 of these cases, the offender forced oral penetration alongside other achieved or attempted penetrative acts (for example, vaginal or anal penile penetration). In some of these cases (10), the chronology of these acts was unclear (because the victim could not remember or because the offender used these acts intermittently). However, in other cases, the sequencing of these acts was recorded. Therefore, in 11 of these, fellatio was the first penetrative act; in five cases, it was the last.

In some of the latter cases, the offender would ejaculate following fellatio; in others he would be having some kind of erectile dysfunction. In one case, the offender changed his mind from vaginal penetration to fellatio; after attempting to penetrate the victim vaginally with his penis, the victim started praying, causing the offender to 'understand' and to penetrate her mouth instead.

In 18 cases, fellatio was the only penetrative act used in the offence. Examples of these include offenders (or groups of offenders) who would force victims to fellate them at knife point, and the offender who, after proclaiming that he 'wanted sex' from the victim, was persuade by her to be fellated instead.

Fellatio has been found, in the most part, in approximately 25%- 45% of offences examining both stranger and non-stranger rapes and sexual assault (25% in McCabe & Wauchope, 2005; 25.1% in Riggs et al., 2000; 28.7% in Sugar et al., 2003; Greenhall & West, 2007; 34% in Canter et al., 2003; 35% in Alison & Stein, 2001; 36% in Magid et al., 2004; 40.9% in Canter & Heritage, 1990). The only real differences were found between this sample and the Häkkänen et al., (2004) study descriptive study, which reported 16% of cases including oral penetration. This may be because of cross-cultural differences in crime between the UK and Finland.

The current study found that fellatio was more frequent than anal penetration and cunnilingus, mirroring an earlier study on serial rape in using data from the Metropolitan Police Service (Davies, 1992, p.182).

5.3.1.9 Ordered no noise

The offender instructed the victim not to make a noise in 47 cases (42.0%). This included orders to not make a noise, not to shout or scream, to be quiet, shut up, shut her mouth or 'shush'. This was either before the victim made any noise, or as a reaction to the noise the victim was making and was often coupled with threats of violence or a weapon.

The present author only noted one study that examined the frequency of offender telling the victim to "shut up" or to be quiet. This was Woodhams (2008), who found that the offenders within the sample of non-serial juvenile rapists directed the victim to be quiet in 20.5% of cases.

5.3.1.10 Stole property

Offenders stole items from the victim in 40.2% (45) of the cases. The items stolen from the victims included mobile phones, cash, credit cards (often with the offender demanding to know the pin numbers), jewellery, handbags, electronic equipment, Compact Discs (CDs) and Digital Versatile Discs (DVDs). Some items of sentimental value were stolen, although there was no indication that this was carried out as an act of spite or a chance to be 'close' to the victim after the attack.

In comparison with other recent behavioural research, the percentage of offenders who stole items from their victims is relatively high. Canter et al., (2003), for example, split items stolen into three categories, where stealing items that "are not recognizable as belonging to the victim (e.g. cash)" (p174) was featured in 20% of the cases; items which were identifiable made up 10%; items that were personal to the victim was 6%. Similar figures were found within Häkkänen et al., (2004). The reason behind such a high rate of theft within the present sample may be interpreted alongside rates of robbery within the MPS area. A recent Home Office study showed that out of 86% of recorded robberies from April 2001 and March 2002 in England and Wales, the MPS force made up 44% (Smith, 2003). More specifically, 15 out of the 20 highest Borough Command Units for robbery in England and Wales were from the MPS region; one borough in particular had the highest rate of robbery offences (5.3% of all recorded robbery). Within the present sample, the highest percentage of rapes occurred within this borough.

5.3.1.11Kissed

In 40 offences (35.7%), the offender ordered, directed or kissed the victim's mouth, face, neck or other parts of her body (excludes cunnilingus). The verbal commands for a kiss and the nonverbal behaviour of the kiss were put into the same category because in all cases where the offender asked for a kiss, he did kiss the victim. In all cases where the offender kissed other parts of the victim's body (seven cases) (for example, back, legs, or arms), the offender also kissed the victim's mouth, face or neck.

Within four of these cases, the offender instructed the victim to kiss him. In three, the offender stated “kiss me”; in one other, he coupled this with a contract, telling the victim “Give me a kiss and I’ll go away.” In one case, the offender told the victim that he wanted a kiss.

Other behavioural studies report similar levels of the offender kissing the victim or forcing the victim to kiss him, in over 40% of cases (42% in Alison & Stein, 2001; 44% in Canter et al., 2003). A slightly lower percentage of 19% was found in the Häkkänen et al., (2004) study and, again, this may because of the nature of rape occurring in Finland. In a descriptive study (Bownes et al., 1991), it was found that the presence of kissing was significantly lower in stranger rapes than those committed by acquaintances (7% as opposed to 33%).

Other studies have considered kissing within the category of victim participation (for example, Canter & Heritage, 1990; Greenhall & West, 2007) so it is difficult to compare the results from the present study to these.

5.3.1.12 Physical violence

The offender was physically violent (not as a means to control the victim) in 38 offences (33.9%).

The offender hit the victim in five cases (4.5%). (Please note that this does not include hitting the victim’s head against a wall or the floor). In four of these cases, the offender hit the victim in order to control her or as a response to resistance. For example, the offender hit the victim if she did not repeat specific phrases to him; another hit the victim to stop her shouting; another to steal her bag from her; the last as part of a surprise attack, in which he had approached the victim from behind and she had felt a “thud on her back.” In one case, the offender hit the victim seemingly not to control; the victim described how she was thrown to the floor, and the offender started to strangle and hit her.

The offender hit the victim’s head against the wall or the floor in seven cases. This only occurred when the offence happened in an outdoor location and included repeated acts and single acts. In the former, one offender banged the victim’s head repeatedly against concrete steps in a garden; another offender kept hitting the victim’s head against the ground in a park; another banged the victim’s head several times on the floor of an underpass; whilst one offender pulled the victim by the hair and “pummelled her head, banging it on the pavement.” In one case, the offender hit the victim’s head on the floor and then the wall; in

two offences, the victim described how the offender had pushed her, hitting her head against the wall once in the process.

The offender cut the victim in six cases (5.4%). This was caused, in four cases, by a weapon (knives, a sharp ring and a razor blade) and the cuts were sustained to various parts of the victims' bodies, notably their lips, face, hands and arms. In two cases, the victims sustained injuries without a weapon, with cuts to her face and hand.

The victim was punched or knocked down in 17 cases. In 12 cases, the offender punched the victim more than once, with most of these acts occurring once the victim was on the floor and some which resulted in the victim falling to the floor. In five cases, the offender punched the victim once at the beginning of the offence, seemingly to control the victim (to force her to move or to stop her from making noise or when the victim had punched the offender). For most occasions when the offender punched the victim, these acts occurred at the beginning or during the rape. In two of these cases, however, the offender punched the victim after the offence had occurred, as he was leaving.

The offender usually punched the victim in her head or face. In one case however, the offender punched the victim in her stomach and face, with such force that her jaw and nose were broken and several of her teeth were knocked out.

The victim reported the offender kicking her in one case. In this, he attacked her, pulling her to the floor and started kicking and punching her. In another case, the victim described how the offender "had his hands on her face and was trying to poke his fingers in her eyes to gauge them out."

Victims recalled how offenders had strangled them in eleven cases. This differs from being 'grabbed by the neck' insofar as the victim used language to describe it as strangling, choking, throttling, or that she had difficulty breathing. The offender would usually use this act of violence amongst others and would strangle the victim throughout the offence. One victim described that, after the offender had initially attacked her, he put "his hands around her throat putting pressure on her windpipe." In another, the offender "grabbed her by the throat, at times strangling her." Another offender "tried to strangle her by applying force to her neck, but wrapping his arm around her"; another victim relayed that the offender had "throttled her around her neck with both hands." In two cases, the force was such that the victim was struggling to breathe; in one of these, the offender "continued to hold her from her neck so that VICTIM was having difficulty in breathing." Finally, one offender held the victim so tightly around the neck that she could not breathe and lost consciousness.

In one case, the offender slapped the victim around the face. This was a response to the victim shouting out for help and he accompanied this act of violence with an order to "shut up."

Descriptive studies using both police records and medical notes suggest that additional violence and physical assault occurs in 25-82% of cases (Riggs et al., 2000; Myhill & Allen, 2002; Kerr et al., 2003; McLean & Balding, 2003; Sugar et al., 2003; Ruperal, 2004; Feist et al., 2007). There is evidence to suggest that stranger rapes are significantly more likely to be physically violent, and cause more injury, than rapes where the victim knows the offender (Jones et al., 2004). When studies explore the different types of rapes where an offender is known and compares these with stranger rapes, the results differ slightly. In fact, rapes committed by an intimate (partner or ex-partner) seem to demonstrate similar levels of violence and physical harm as stranger rapes, when compared to other forms of acquaintance rape (Feist et al., 2007; Ruperal, 2004; Ullman, Filipas, Townsend, & Starzynski, 2006;).

Studies examining the structure of rape behaviours in stranger rape and sexual assault specifically tend to show similar levels of physical violence as the present study. Alison and Stein (2001) found that single acts of violence were found in 29% of their sample, whilst Canter et al., (2003) found a percentage of 28%. Greenhall and West (2007) found a higher percentage of 54% of 'actual violence' in their study, which may reflect the nature of the sample they were investigating (those detained at a high secure hospital).

5.3.1.13 Threatened physical violence

The offender threatened the victim, her children or himself with physical violence in 38 cases (33.9%). These were sometimes quite specific, with one offender telling the victim "I'll punch you," another threatened to throw her off a balcony. In some cases, these threats were implied threats and were often conditional; for example, "I won't hurt you if you do as I say, "if you struggle, I'll hit you again", "do it, or I'll hurt you", "if you stop screaming, I won't hurt you" and "I don't want to have to hurt you". More general threats of include "don't make it worse for yourself."

The threat of violence was not only made against the victim; one offender threatened the victim's children, who were also present in the house, whilst another offender told the victim he would hurt himself if she told anyone about the rape.

Within these, the offender threatened to kill the victim in 24 cases. In most of these cases, these threats were conditional on the victim's behaviour; for example, "if you tell

anyone, I'll come back and kill you", "don't scream or I'll kill you", and "if they are wrong (PIN numbers), I'll come back and kill you and your boyfriend. Threats to kill were also unconditional; five offenders told the victim he was going to kill her.

The sample contained three cases (2.7%) where the offender threatened the victim with further sexual violence. Two of these were used when the offender also threatened the victim with abduction (see above). In both, the offender stated that the victim would be subjected to multiple rapes by other men when they were held captive. In the other case, the offender offered the victim a 'contract', saying "If you do this, I'll let you go, if you don't, I'll rape you."

In two cases, the offender threatened to abduct the victim. In one, he told the victim that he would tie the victim up, take her to another location and keep her there; in another, he threatened to keep her chained up in his house.

Implied threats were also coded within this category. The offender told the victim that he would not hurt her if she did what he said in seven cases. Examples include the offender telling the victim that he "would not kill her if she did what he said", "if you stop screaming I won't hurt you", and "it will be ok if you don't make any noise."

Descriptive studies rarely measure the threats made towards victims. However, one medical study, carried out by Bownes, O'Gorman, and Sayers (1991) found that, compared with acquaintance rapes, those committed against strangers were less likely to be threatened. In those stranger rape cases where the victims were threatened, these threats were measured to be more 'specific' threats (that is, to harm), rather than more indirect or emotional threatening behaviour. Behavioural studies have measured various kinds of threats within detected stranger rapes, with differing results. Canter et al., (2003), for example, found that 20% of their cases included 'verbal violence' (defined as being when "the offender threatening the victim at some time during the attack" (p.174). Häkkänen et al., (2004) split the differing kinds of threats made by the offender into 'threats to kill' (29%), 'threats of physical violence' (9%) and 'threat of weapon present' (3%). The high percentage of cases within the present study may be due to the fact that all kinds of threatening behaviour, direct, indirect, of physical violence, use of a weapon or of death were all coded within the same variable.

5.3.1.14 Ejaculated

The victim recalled the offender ejaculating in 37 cases (33%). He ejaculated in the victim's vagina or anus or elsewhere on her body in 20 cases (17.9%) The offender ejaculated

in the victim's mouth in 13 offences (11.6%) and in other places around the attack location, in four cases.

Few studies on non-serial rapes record whether the offender ejaculated or not. Häkkänen et al., (2004) found that 56% of their sample had done so, whilst Woodhams (2008) found a smaller percentage of 12.8%. These differences may be due to the samples drawn on (adults versus juvenile offenders).

5.3.1.15 Self-disclosure personal

In 32 cases (28.6%), the offenders disclosed some information about their own background. Of these, there were 15 (46.9%) that were later verified to be lies (see *Self-disclosure lie* variable). This information included; his name, age, where he lived, his mobile telephone number, his drug use, his nationality or parentage, his occupation, his psychiatric history, about his family or relationships, or other personal information.

In 14 cases (12.5%), the offender told the victim his 'name.' However, in nine of these cases, the offender gave the victim a false name. In seven cases (6.2%), the offender revealed his age. However, in five of these cases, this was a lie. In three of these false cases, the offender was actually older than he had stated; in two cases, he was younger.

Offenders told their victim where they lived in four cases (3.6%). Three of these offenders stated that they lived in a particular area, whilst one stated that he lived in particular street. In all of these cases, the offenders were lying. In another case, the offender gave the victim his mobile telephone number (this information was unable to be verified).

Five offences (4.5%) contained the offender disclosing details about his family or relationships. Again, it was difficult to verify this information. One offender told the victim that he had "lost his girlfriend", two that they had wives and children, and one offender who told the victim of his sister's family. Lastly, one offender had told the victim that his mother had passed away recently. In another five cases (4.5%), the offender told the victim that he held a particular nationality or parentage. It was not possible to verify this information.

Within four cases (3.6%), the offender told the victim of his drug use; two of these seemed to be excusing their behaviour (see *Excused or justified*). In the two other offences, the offenders seemed to just be going into their own backgrounds a little more; one offender admitted that he smoked drugs, the other that he had previously done so.

Other personal information disclosed to the victim included one offender telling the victim about his psychiatric history. This was unable to be verified. Another offender (0.9%)

told the victim that he worked in a particular place. However, it was impossible to verify this information using the CRIS statements.

Alongside these, as one offender left the victim, he told her where he was driving to; in the other, the offender divulged his method of transport.

Behavioural studies that measure whether the offender reveals information about himself relate the offender does this in around a quarter (24% for Alison & Stein, 2001) to over a third of cases (40% in Häkkänen et al., 2004).

5.3.1.16 Multiple acts of violence

Multiple acts of violence occurred when the offender committed the above acts of physical violence (not control violence) more than once or used more than one type of violent act. In the present sample, there were 29 instances (25.9% of cases) where the offender used multiple acts of violence against the victim. 16 of these cases included the offender repeatedly using the same act; 12 hit or punched the victim repeatedly; one solely hit the victim's head against the ground and four kept strangling then releasing, strangling then releasing the victim. In the rest of the cases, the offender used different acts of (sometimes repeated) violence. All of these cases included the offender punching and/or hitting the victim on her body or face or against a wall and were coupled with strangled (n = 5), trying to gouge her eyes out (n = 1), biting the victim (n = 2) or kicking the victim (n = 1). Some offences included several different acts such as slapped, punched and suffocated; slapped, hit head on ground and punched, and the case where the offender punched the victim, hit her head on the ground, strangled her and then bit her.

The extent of the victims' injuries can also be a record of the amount of excessive violence occurring in the attacks. For example, one victim, attacked in a park, sustained a broken jaw, nose and had her teeth knocked out by the offender. In another case, a police officer recalls (in notes made on the CRIS report), how the victim "had bad injuries to both her eyes; that had large swellings; her nose and lips were swollen. There was blood all over her face and hands." Another, older victim sustained a particularly brutal attack which resulted in her having her shoulder dislocated and arm broken by the offender.

Past research shows that excessive or multiple acts of violence are exhibited within varying degrees across descriptive studies dealing with all kinds of rape. There is evidence to suggest that stranger rapes are significantly more likely to be physically violent, and cause more injury, than rapes where the victim knows the offender (Jones et al., 2004). However, when the 'known' offender category is further broken down, results differ slightly. Rapes

committed by an intimate (partner or ex-partner) seem to demonstrate similar levels of violence and physical harm as stranger rapes, when compared to other forms of acquaintance rape (Ruperal, 2004; Ullman et al., 2006; Feist et al., 2007).

In studies where only stranger rape is considered, excessive violence is seen to be less frequently occurring than the present sample. For example, Canter et al., (2003) and Alison and Stein (2001) both found that 15% of their cases involved multiple acts of violence. Häkkänen et al., (2004), however, found that more than one act of violence occurred in 23% of cases, similar to the present study.

5.3.1.17 Weapon to scene

This variable refers the victim having seen or felt that the offender had a weapon and that this weapon was brought to the scene of the offence by the offender. (Please note that this differs from if the offender threatened the victim with a weapon brought to scene but the victim did not see it). In 29 offences (25.9%), the victim felt or saw a weapon that the offender has brought to the scene. In most of these cases (n = 23), the weapon was a knife; in two cases, the weapon was a crowbar and in one case each, the weapons were a pair of scissors, a screwdriver, a ring, and a dog.

There were no cases where the victim was injured seriously by the offender through the use of his weapon. Minor injuries were inflicted either intentionally (one offender cut his victim's hand 'slightly' so that she would open her front door) or in a struggle (the same offender's knife cut the victim in the struggle that ensued).

Several descriptive studies of rape have found that weapon use is relatively lower than that recorded here. In UK studies, weapons (usually knives or fire-arms) have been found to be used in a small percentage of cases (4-11%), either to harm or coerce the victim (Kerr, et al., 2003; McLean & Balding, 2003, 8.2%; Ruperal, 2004; Feist et al., 2007). These descriptive studies, however, do not differentiate between types of victim-offender relationships; some studies suggest that weapon use is higher in stranger rapes, in comparison to rapes carried out by 'knowns' (Riggs et al., 2000; Bownes et al., 1991).

Some behavioural studies of stranger rape have found that a weapon is brought to the scene (or intimated) in a similar percentage of cases as the present study; for example, Canter and Heritage (1990) found this percentage was 22.7%. However, Häkkänen et al., (2004) found that 6% of offences included the offender bringing a weapon to the scene. This may be due to cross-cultural differences between the UK and Finland. Indeed, the high rate of weapon use in this study may reflect high levels of weapon use in the MPS area, in general;

recent research suggests that 'most serious knife crime' is higher in London (34% of the national total) than within other areas of the UK (Home Affairs Committee, 2009).

Whether the weapon was brought to the scene or whether it was taken from the scene is not always noted. In these cases, the percentage of offenders with weapons is higher than those within this category (and therefore should be compared with the total percentage achieved by adding together those within this variable and the variable *Weapon from scene* below). These studies report levels of weapon use from over a third (29% in Canter et al., 2003; 43% in Alison & Stein, 2001) to nearly three-quarters (71% in Greenhall & West, 2007). The high levels of use of weapons within the last study may be due to the nature of the sample used, as discussed previously.

5.3.1.18 Ordered property

In 25 cases (22.3%), the offender requested or ordered the victim to give him property to steal. The offenders often asked "where is your bag?", "have you got a bank card?", "where is your money?", "have you got any money?" Where's your mobile?" Some of these offenders asked for these items at the beginning of the attack; examples of these include rapes that start as robberies, with the offender asking for the victim's money or bag from the outset. This also includes confidence approaches where the offender has asked the victim for 50p or £1. In other cases, the offender asks for money at the end of the offence; asking for money or valuables after he has raped her.

In eight of these cases, the offender ordered the victim to give him items to steal. This occurred mostly at the beginning of the offence, telling the victim "give us your money", give me your bank card"; "give me your stuff"; "give me your phone and your bag"; and "give me your money." One offender told the victim to pack various articles of property for him whilst he wandered around her house. In one instance, the offender ordered the victim's mobile phone and money at the end of the offence.

The percentage of offenders who demanded goods in the present study is higher than that found in some previous studies. Canter et al., (2003) found that this presented in 16% of their cases, whereas in Häkkänen et al., (2004) this figure was less than 1%. As stated within the Stole section, the higher percentage in this study may reflect high rates of robbery in London in general. The study conducted by Alison and Stein (2001) however, found that the offenders demanded goods in 25% of their 139 stranger rape offences. This percentage is in line with the present study.

5.3.1.19 Verbal abuse

The offender was verbally abusive to the victim by using a demeaning term to describe the victim in 28 cases (25.0%). In most of these cases, the offender called the victim a bitch; in two, he called her a whore and in two others, he called her stupid and useless. There were two cases where the offender was racially abusive to his victim.

Demeaning language is often measured in other behavioural studies. Häkkänen et al., (2004), for example, relate how the offenders insult their victims in 8% of their cases, whilst Canter et al., (2003) and Alison and Stein (2001) have slightly higher percentages of 18% and 19% respectively.

5.3.1.20 Disturbed

The rape was interrupted in 27 cases (24.1%). Rather than being a behaviour exhibited within the offences, this variable can be used to explain why rape behaviours can be limited or changed due to situational variations. In the present sample, this means that nearly a quarter of rapes were disturbed, either by a witness, the police or a noise. The implications of this are discussed in the Chapter Summary.

5.3.1.21 Threatened weapon

In 23 cases (20.5%), the offender verbally threatened the victim with a weapon, either saying he had one, or by stating that he would use it to harm her. Usually, this was around the use of a knife and was coupled with the offender having one. Offenders stated "there's a knife to your throat," or "look I have a knife." This also includes occasions when a knife was "intimated." The offenders also unconditionally threatened the victim with a knife, describing how he would injure the victim with it. For example, "I'm going to stab you", "I will stab you," "I'll stick this through you", "I'm going to cut you and slit your throat and wrists" and "I'll stick this through you." Conditional threats were also made, with offenders stating "if you scream again, I'll stab you" and one offender threatening to "slash her face with a knife if she screamed or made any noises." The use of other weapons were also verbally used; one offender told the victim he had a gun, whilst, in another attack, one offender told her that he would "feed her to the dog."

Other behavioural studies relate how offenders threaten their victims in general (for example, 'verbal violence' in Canter et al., 2003). However, few studies examine the specific threat of a weapon (without the victim necessarily seeing the weapon). Häkkänen et al.,

(2004) do, and report 3% within their sample; a difference that may be due to cross-cultural differences.

5.3.1.22 Unconditional threat

The offender threatened the victim with violence, weapons, death, and damage to her property without this being conditional on her behaviour in 23 cases (20.5%). This variable is similar to announcement of intent and includes the offender telling the victim "I will kill you", "I will stab you" or the victim reports how the offender "threatened to harm her."

As stated before, most behavioural studies report general threats or verbal violence (for example, Canter et al., 2003). The type of threat identified here is difficult to compare with other studies. However, taking the percentage of unconditional and conditional threats together (which consist of the array of types of threats of weapon presence, threats of physical violence, and threats of not reporting), it is possible to compare this figure with other studies. Altogether, therefore, within the present sample, at least one type of threat was present in 52 cases (46.4%).

This percentage is similar to other behavioural studies; Greenhall and West (2007) found that their sample included threats in 39% of cases, whilst Canter et al., (2003) report how the offences within their sample contained 20% of verbal violence and 23% of threatening the victim not to report.

5.3.1.23 Anal penile

In 19.6% of cases (22), the offender penetrated the victim with his penis. In most of these cases (20), the offender had also penetrated the victim's vagina. In two of the cases where he did not, the offence was interrupted by a witness.

Anal penetration is often measured in medical studies. Figures for female victims range from 4-21% (Riggs et al., 2000; Sugar et al., 2003; Magid et al., 2004; Jones et al., 2004). Behavioural studies, based on police records bear similar results to that of the present sample; Häkkänen et al., (2004) report 15%, Canter et al., (2003) report 19% and Greenhall and West (2007) Alison and Stein (2001) both found 20%.

5.3.1.24 Non sexual questions

The offender asked the victim non sexual questions in 19.6% (22) of the offences. He asked the victim's name in eight cases (7.1%), her address in six cases (5.4%) and her age in three cases (2.7%). Within the non sexual questions about where the victim lived, one

offender asked the victim her address so he could abduct her and take her there; in the other three cases, the offender wanted to know "where she was from", or "she lived locally."

The offender also asked the victim non sexual questions about the victim's boyfriend or husband in five cases (4.5%). In three cases, the question was posed as in relation to apprehension or for further offences. For example, one offender asked the victim where her husband was, it was to see whether or not the offender would be interrupted. There was only one instance of the offender asking the victim more probing questions about the victim's boyfriend. In this case, the offender had asked the victim why she was in the area. She has told him that she had had a row with her boyfriend, the offender asked her later in the offence, "why did your boyfriend split up with you?"

The offender asked for other, more detailed background non sexual questions from the victim in seven cases (6.2%). These included two offenders asking if the victim had HIV or AIDS, one asking what the victim was doing in the area and one wanting to know whether the house he attacked her in was her own or whether it was council owned. In three cases, the offender wanted to know more about the victim; one offender asked whether she was a student, another asked a series of questions including whether she worked or was at college and if she needed a visa to stay in the country. Lastly, after raping the victim, the offender asked her to talk about herself and her interests.

In a further two cases, the offender asked the victim whether she smoked cigarettes, or took drugs (in the latter the offender specifically asked if the victim smoked crack).

The percentage of offences that included the offender asking non sexual questions of the victim within this sample is similar to those exhibited in previous behavioural studies. Alison and Stein (2001) found that 25% of their offences included this inquisitiveness, whilst Canter and Heritage (1990) and Häkkänen et al., (2004) found percentages of 15.2% and 13% respectively.

5.3.1.25 Ordered undress

The offender ordered the victim to undress in 20 cases (17.9%). In some cases, the offender instructed the victim to take off or undo some of her clothes such as their jeans or trousers, mainly to enable the offender to penetrate the victim. In other cases, the offender would order the victim to lift her top, to reveal her breasts. In one case, the offender ordered the victim to take off a piece of their clothing (for example, a jacket) and then he took off other items. In another, the offender was vague, telling the victim to "take something off." In other cases, the offender gave the command to "undress" and the victim had to take off all her

clothes. Lastly, in one instance, the offender methodically ordered the victim to take off her jacket, then her shirt, then her bra, then her trousers, and then her underwear.

The present author could find one study that directly examined the percentage of cases where the victim was ordered to undress; Woodhams (2008) found that 10.3$ of the non-serial juvenile offender sample ordered the victim to undress.

5.3.1.26 Vaginal digital

The offender penetrated the victim's vagina with his finger in 19 cases (17%). All but one of these offences involved the offender also penetrating the victim with his penis.

Studies that examine vaginal digital penetration in stranger rape echo the findings of the present study. Häkkänen et al., (2004) found that the offender placed his finger in the victim's vagina in 14%, whilst studies based on medical records record percentages of 20% (Bownes et al., 1991) and 25% (Jones et al., 2004) and Alison and Stein (2001) report 32%. Other behavioural studies examine digital penetration but do not specify whether this is vaginal or anal; Greenhall and West (2007) found digital penetration in 27% of cases, and Riggs et al., (2000) report 32.3%

5.3.1.27 Gagged hand

The offender placed his hand over or in the victim's mouth in 18 cases (16.1%). In the majority of cases (13), this occurred at the beginning of the attack, on approach, to stop the victim screaming. In five of these, the offender tries to cover the victim's mouth during the offence, struggling against the victim, sometimes making her unable to breathe.

Some behavioural studies only record times when the offender gagged the victim using material. For example, Alison and Stein (2001) reported how the offender out material in the victim's mouth to stop her speaking or making any noise, in 17% of offences. Similarly, Canter et al., (2003) found this percentage to be 11%. Studies just examining gagging with the offenders' hand cite percentages similar to this one (20% in Häkkänen et al., (2004), 20.5% in Woodhams (2008).

5.3.1.28 Condom

The offender used a condom or the victim saw or heard a condom wrapper being opened in 16 cases (14.3%). The victim recalled how the offender brought a condom to the scene in the majority of these cases (thirteen). In one, the victim asked the offender to use on (and he produced one) and in another, the offender already had a condom on his penis when

he attacked her. In some of these cases (three), the victim was not sure if the offender actually used the condom; she had seen it but could not be certain that it was placed on the penis before penetration.

In one case, the offender used both a condom and penetrated the victim through her tights. In another case, the offender used a condom that was at the scene.

Whether the offender used a condom is not widely recorded in behavioural studies. However, in the cases where this was measured, the percentages found were lower than the present study. Häkkänen et al., (2004) found that 5% of the offenders used a condom within the offences, whilst Beauregard and Bouchard (2010) found that this percentage 1.8%.

5.3.1.29 Rummaged

The offender rummaged in the victims' bag or drawers searching for items to steal in 16 cases (14.3%). To date, the rate of the occurrence of this variable has not been reported frequently in the literature; although Davies (1992) does report that is does occur. Häkkänen et al., (2004) did measure this and found that only 2% of their sample rummaged for items to steal. It could be that this variable is included in the theft variables that are presented in other studies.

5.3.1.30 Ordered no report

Offenders instructed the victim not to report the offence in 15 cases (13.4%). This included general orders not to "say a word" or not to "tell anyone" as well as ordering the victim not to tell a specific person such as her boyfriend or the police. These included cases where the order was coupled with a threat; some offenders threatening that they would "come after the victim" if she said anything, stating that "he knew where she lived and would be back to kill her" and another stating that he would hurt her and himself if she told anyone. The offender asked the victim not to report the offence in two cases (1.8%). In these, he asked her not to call the police.

This percentage is the similar as that quoted by Häkkänen et al., (2004) (9%), Alison and Stein (2001) (23%) and Canter et al., (2003) who found the offender threatened the victim not to report in 23% of the cases.

5.3.1.31 Self-disclosure lie

As reported above, there were instances where the information disclosed by the offenders to the victim could be checked alongside the offenders' real background

characteristics to check the veracity of this information. There were 15 instances (13.4%) where this information was able to be identified as untrue (details explained in the *Self-disclosure personal* and *Self-disclosure criminal* sections). The intention of this misinformation could be an intention to mislead or get to the victim to reveal more information about her background (for example, an attempt to strike up a conversation).

Previous studies have shown variability in the levels of the offender lying about the information he revealed; Beauregard and Bouchard (2010) found that 1.4% of offences contained offenders lying about their name. Davies (1992) found that about 15% of offenders within her sample lied about their name and/or where they lived.

5.3.1.32 Victim arousal

The offender commented on the victim's arousal, telling or asking her whether she was enjoying the offence, or asking her whether she enjoyed specific acts in general. This occurred in 14 offences (12.5%). In six cases, the offender commented on the victim's sexual enjoyment. In these cases, the offender stated that he thinks the victim "wants it" or is "begging for it." In one case, he told the victim that she would enjoy the rape and another offender told her that she would feel good. The offender wanted to know that she was 'aroused' in another and to "tell him he was good." In one case, the offender told the victim that he wanted to her to enjoy the offence, telling her that he wanted to "pleasure her."

In six cases, the offender asked the victim whether she was enjoying the sexual activities performed in the rape. In one case, the offender asked the victim "how does this feel?" In others, the offender asked the victim specifically whether she was "enjoying it", if she "liked it", was "it nice" or is she was "feeling good."

In two cases, the offender asked the victim whether she enjoyed specific acts, in reference to those acts in general rather than what he subjected her to within the rape. In one case, the offender asked the victim whether she "liked her breasts sucked", whilst in the other, the offender asked the victim whether she liked to perform fellatio.

In behavioural studies, it is likely that these kinds of comments are coded under 'offender sexual comment' (for example, Alison & Stein, 2001) or 'sexual comments' (Häkkänen et al., 2004). Woodhams (2008), however, examined this directly, finding that within 5.1% of her sample, the offender had commented on the victim's arousal or 'enjoyment' of the offence.

5.3.1.33 Multiple offenders

In 13 offences (11.6%), there was more than one offender present during the offence. In 10 offences (8.9%), all offenders raped or tried to rape the victim. In one case, one offender raped the victim, left the house where the offence had been committed, where another offender then tried to rape her. In two cases, two offenders were present at the beginning of the attack; in one offence, one of the offenders acted as a look out and in the other case, one of the offenders observed the offence.

The Metropolitan Police's Sexual Offence Index states that a rape can be defined as a 'group rape' if there is more than one offender involved, aware of or acting as a look out within a rape situation (Ruperal, 2004, p.4). Ruperal (2004) presents the finding that from there were 320 group rapes within the MPS district from 2001/02 and 2002/03, 65% of which were reported as being committed by a stranger. Out of the total rapes reported in this period, therefore, this works out around 11% of the total number of stranger rapes reported within the Ruperal (2004). This figure is in line with the present study.

5.3.1.34 Ordered no look

There were 12 cases (10.7%) where the offender told the victim not to look at him, usually directing the victim to look away or to focus on something else. For example, one offender ordered the victim not to look at him and to look at the cupboard in her bedroom instead. This was probably used to help protect his identity and included the offender telling the victim not to look at his car registration details. This was also used to help aid his escape; one offender told the victim not to look back when she was leaving the scene and another offender told her not to watch him.

Some studies, measure the overall way in which the offender prevents the victim from seeing his face (without the use of a disguise). For example, Beauregard and Bouchard (2010) found that 32.9% of their sample of incarcerated sex offenders had prevented their face from being seen by the victim. Woodhams (2008) directly measured the offender ordering the victim not to look at him, and she found that this was exhibited in 2.6% of offences.

5.3.1.35 Breasts

In 11 cases (9.8%), the offender sucked or kissed the victim's breasts. In all cases, this occurred once the victim's breasts had been exposed.

It is difficult to directly compare this variable with other behavioural studies because they mostly record whether the offender fondled the victim's body (including their breasts)

(for example, 74% in Alison & Stein, 2001) and/or whether the offender touched or kissed the victim's breasts (30.8% in Woodhams, 2008).

5.3.1.36 Complimented

The offender complimented the victim's physical appearance or sexual 'performance' in 11 cases (9.8%). In five cases, the offender commented on how the victim was generally "beautiful", "cute" or "sexy." In three cases, the offender told the victim that she had nice breasts. Lastly, one offender compliments the victim on her vagina. The offender complimented the victim's 'performance' in two cases.

Varying levels of compliments have been seen within behavioural studies. Häkkänen et al., (2004) found a low percentage of 4%; Greenhall and West (2007) found a similar percentage to the present study of 12%. Slightly higher percentages were found in Alison and Stein (2001) of 20% and Canter et al., (2003) of 16%.

5.3.1.37 Tore clothing

The offender tore the victim's clothing in 11 offences (9.8%). In three cases, the victim's knickers or bra was described as being 'torn' or 'ripped off.' It is not clear as to whether these were actually torn or whether this was an adjective used to describe the force of the removal. In another three cases, the offender ripped the victim's tights or knickers whilst trying to gain access for penetration. In four cases, the victim's clothes were torn in the struggle; one police officer describes how the offender ripped the victim's trousers 'around the zip area'; in another, that, as the offender pushed the victim to the ground, he tore her t-shirt at the same time and in another, that the victim's overcoat was ripped and torn in the fight that has ensued. In one case, the victim described how the offender had cut her t-shirt off to expose her breasts.

Previous research has shown similar levels of tearing clothes. Canter and Heritage (1990), Alison and Stein (2001) and Canter et al., (2003) found percentages of 21.1%, 19% and 18% respectively in their samples. These studies and the present study include cases where the offender does and does not tear or cut clothing intentionally (perhaps because it is difficult to determine this). However, Woodhams (2008, p.328) measures cases where the offender intentionally ripped the victim's clothing. Here, the percentage is much lower, at 5.1%.

5.3.1.38 Blindfolded material

In ten cases (8.9%), the offender covered the victim's eyes with material so she could not see. In two of these, the offender used this technique as a way of overpowering the victim on approach. In one, he pulled her hood over her face and dragged her to the ground as he attacked her from behind; in the other, the offender pulled her jacket over her head and threw her to the floor. In one case, the victim was struggling when the offender was trying to rape her on a bed; he placed a pillow over her face to restrain her. In three cases, the offender covered the victim with material to protect his identity, the offences taking place in either the victim's work place or her home. In one case, on coming across the offender, the victim's dressing gown was pulled up over her face as the offender walked her around her house finding items to steal. In another, the offender told the victim to go back to her bed and placed a duvet over her face so she could not look at him. In the first case, the offender placed a jumper over the victim's head and ordered her not to look at him. Lastly, in two cases, the offender placed a blindfold over the victim's face as they were abducting her, presumably so that she could not see where she was going.

The offences contained certain acts that led the victim to having her eyes or mouth covered. Apart from the offender using his hands to cover the victim's face, they often used items about the victim's person, such as their clothes, to cover her eyes. One offender pulled the victim's dressing gown over her head and told her to lie face down on the bed. Another offender told her to go back into her bed and then covered her head with the duvet. Other victims recalled how they had their clothing pulled up over their heads to obscure their vision. One victim told of how the offender pulled her cardigan over her head as the offender ran away, after the attack. Another recalled how she tried to scream during the attack and the offender "pulled up her coat and wrapped it around her head." Sometimes the offender placed items over the victim's face to subjugate them. For example, in a violent struggle that took place between victim and offender, the offender puts pillow over the victim's face.

Previous research has identified varying percentages for the presence of the offender blindfolding the victim. Studies such as Alison and Stein (2001) and Canter et al., (2003) report 17% and 15% respectively, whilst other studies relate lower percentages. Canter and Heritage (1990) report 4%, whilst Häkkänen et al., (2004) report less than 1%. The reason for this difference in percentages is difficult to ascertain, but the use of blindfolding with material might affected by what kinds of material (clothing, bedding) are available at the offence location.

5.3.1.39 Erectile dysfunction

This variable refers to the suspect not being able to achieve or maintain an erection. The victim reported this in 10 cases (8.9%). Some of these victims described the offenders' penises as "going soft" and others that the offenders could not penetrate the victim because they were not "hard", or were having problems keeping his penis erect.

Few studies have examined erectile insufficiency in stranger rape; Bownes et al., (1991) found that erectile insufficiency was found in 27% of stranger rape cases which was significantly higher than in acquaintance rapes (0%). This percentage is also higher than the level of erectile insufficiency in the present sample, and this may be due to the differences in samples used (Bownes et al., 1991 used cases where the victim was seeking compensation after the offender had been convicted). Woodhams (2008) reported a similar percentage to the present study, 7.7%.

5.3.1.40 Locked in

The offender kept the victim locked in a car or a building within 10 cases (8.9%). In nine of these cases, this was the scene of the offence (including a car, a flat, a bedroom, and a night club toilet). In one case, the offender made the victim have a shower in her bathroom then left the room locked to facilitate his escape (by hindering hers).

The author found it difficult to locate other studies that had measured or observed how many cases involved the offender locking the victim in. Woodhams (2008) found that 10.3% of offences within the non-serial juvenile stranger rape sample involved the offender blocking the victim's escape which may include locking her in.

5.3.1.41 Ordered redress

There are 10 cases (8.9%) when the offender ordered the victim to put her clothes back on. This included telling the victim to put her trousers back on or up, to put her clothes back on or to get dressed. This variable is not usually directly recorded within behavioural studies; however, Woodhams (2008) found that 5.1% of non-serial rapes committed by juvenile offenders contained the offender directing the victim to redress. This is a similar percentage to the current study.

5.3.1.42 Penis testicles pubic hair touched

In 10 cases (8.9%), the victim was forced to touch the offender's penis, pubic hair or masturbate him. This echoes that of Woodhams (2008) who found that 10.3% of her non-serial stranger offences included touching or masturbating his penis.

Other studies do not directly report the levels of this behaviour, but rather, describe how many offences included the victim having to participate physically in this offence (29% in Canter et al., 2003; 25.8% in Canter & Heritage, 1990; 18% in Häkkänen et al., 2004).

5.3.1.43 Cuddled

The offender 'cuddled' the victim, or put his arm around the victim, in nine cases (8.0%). In one, he hugged her after raping the victim and telling her he liked her. In the other, the victim asked the offender to cuddle her at the end of the offence, to prevent him from raping her again.

Previous studies do examine the ways in which the offender expresses affection towards the victim, which includes cuddling (for example, Davies, 1992). Rarely do behavioural studies specifically measure whether the offender hugged the victim. An exception is Woodhams (2008) who found a similar percentage as the present study, 12.8%.

5.3.1.44 Implied knowing

In eight cases (7.1%), the offender implied knowing or having seen the victim before the incident. The present study echoes the percentages found in other behavioural studies. Alison and Stein (2001) found that 8% of offences contained the offender implied knowing the victim, and Canter et al., (2003) found that this percentage to be 10%. Häkkänen et al., (2004) found a slightly lower percentage of 5%.

5.3.1.45 Self-disclosure criminal

In eight cases (7.1%), the offender told the victim about previous offences he had carried out. It was difficult to verify most of these cases as the CRIS records only have a record of the offences that the offenders had been arrested for and may not be a complete picture of the offenders' previous offending. The reasons behind the offender disclosing this type of information may be as an implied threat (see Davies & Dale, 1997). As stated previously, other studies have examined the level of self-disclosure within rape offences (for example, Häkkänen et al., 2004 and Alison & Stein, 2001). Studies directly examining the

extent to which offenders will disclose criminal information are few; however, Woodhams (2008) found that 7.7% of her non-serial sample did so.

5.3.1.46 Ordered wait escape

The offender ordered the victim to wait before escaping or leaving the scene in 6.2% of cases (seven). The offender would tell the victim to stay in her room and wait two minutes before she was allowed to leave; not to move until the offender has gone or to wait five minutes. This was also sometimes reinforced by a conditional threat; one offender stated "Stay where you are, otherwise I'll be back and don't even think opening the door, until I've gone", whilst another told her "You sit down until I have gone, don't move because if you do I will come back."

Woodhams (2008) described how 7.7% of offenders within the non-serial stranger rapes directed the victim to stay where she was whilst he escaped. Other studies do not specify the levels of this type of behaviour but do recognise that offenders will take precautions to ensure a safe exit (Davies, 1992; Grubin et al., 2001).

5.3.1.47 Weapon from scene

This variable refers the victim having seen or felt that the offender had a weapon and that this weapon was from the scene of the offence. (Please note that this differs from if the offender told the victim or threatened the victim with a weapon from the scene). In seven cases (6.2%), the offender used a weapon from the scene; in four of these, the offender used a knife taken from the scene's kitchen; in another, the offender used a gun, in another a razor blade. In one case, the offender used a bottle of bleach taken from the bathroom of the scene.

As previously noted in the *Weapon to scene* section, most studies do not differentiate between weapons brought to or from the scene. However, Häkkänen et al., (2004) does report this, finding a similar percentage of 10% within their sample.

5.3.1.48 Sexual questions

The offender asked the victim sexual questions in seven offences (6.2%). These included five cases where the offender asking the victim whether she had has ever experienced different sexual acts or how long it had been since she had had a specific act. One offender asked whether this offence was the victim's "first time", another whether she had "done this before"; two offenders asked how long ago had the victim last had sex; another asked the victim if she had ever had oral sex.

In two cases (1.8%), the offender asked the victim about the sexual activities the victim had engaged with their partner (but not whether the victim has a partner or not). In one of these, he asked the victim she liked it when her boyfriend "sucked her tits." In the other, the offender asked whether she had given her boyfriend "blow jobs".

The percentage of this variable is reported in only a few behavioural studies. For example, Woodhams (2008) found that these types of questions were found in 12.8% of her non-serial offences perpetrated by juveniles.

5.3.1.49 Apologised

The offender apologised to the victim in six cases (5.4%). In most of these cases (four), the offender said sorry at the end of the offence but in two, they repeated sorry more than once throughout the offences, with one specifically saying that he regretted what he had done.

There are a range of varying levels of this type of verbal behaviour found in previous studies. Some studies show how the offender apologised in 9% (Häkkänen et al., (2004), 13% (Alison & Stein, 2001), and 15% in Greenhall and West (2007). However, Canter and Heritage (1990) found that 50% of their offences contained apologies made by the offender.

5.3.1.50 Bit

Within the present sample, 5.4% (6) of cases include the offenders biting their victims. These were recorded as being in various places on the victims' bodies including breasts and chest areas. One offender bit the victim so severely "individual teeth marks could be seen."

Behavioural studies do not always record biting behaviours but when they do, the instances are relatively infrequent; Häkkänen et al., (2004) found too that 6% of cases included biting. Greenhall and West (2007) found a slightly higher percentage of 15%; this could be due to the sample they derived their data from.

5.3.1.51 Disguise

5.4% (six) of offenders used some kind of *disguise* when attacking their victim. Most offenders within the sample did nothing to protect their identity, choosing to allow the victims to see their faces. Only a small minority of victims recalled the offender doing so by

covering their face; in these cases, the disguise was a balaclava, scarf and in one cases, a bandana.

Small percentages are also reported in other behavioural studies; Canter et al., (2003) report 6% whereas Häkkänen et al., (2004) found that the offender used a disguise in less than 1% of cases. However, Alison and Stein (2001) found that disguises were worn in 16% of their 139 stranger rape offences. A recent study by Beauregard and Bouchard (2010, p.1163) found that 44.1% of their sample of incarcerated sex offenders had concealed their identity (either by wearing a mask or gloves) and that 32.9% had prevented their face from being seen by the victim. These higher percentages may reflect the differences in the sample considered or may reflect the increasing awareness of offenders of ways in which to avoid detection (Stevens, 2008 cited within Beauregard & Bouchard, 2010).

5.3.1.52 Excused or justified

The offender excused or justified his actions in six cases (5.4%). In two of these, the offender excused his behaviour by explaining that it was to not their own free will. In both of these, the offender was not excusing his sexual offending, but why he was robbing the victim. Also in both, the offenders explained that they were stealing because of needing money for a drug addiction. Another offender told the victim that they had raped because they 'needed to.' In one case, the offender directly excused his behaviour by telling a 'sad tale.' Two offenders justified their actions by implying that the victim deserved the rape.

According to Davies et al., (1997), excuses are an admittance of wrong-doing, whereas justifications are not. The level of these types of verbal behaviour is not always reported within studies; however, Woodhams (2008) found that her sample of non-serial sex offenders excused or justified their actions in 5.1% of cases.

5.3.1.53 Foreign language

In 5.4% of cases (six), the victim could not understand the speech of the offender because they were speaking in a foreign language or a language not native to the victim (that is, the victim was not an English speaker). In most cases, this became apparent when there was more than one offender; the victims reported that the offenders were "talking aggressively in a foreign language." One victim explained how, although the offender did talk to her, he "didn't speak English well"; another victim did not understand the offender because she English was not her first language. This has implications for the coding of verbal behaviours within the rapes and these are discussed in the Chapter Summary.

5.3.1.54 Masturbated hand

The offender masturbated himself in 5.4% (six) of the cases. In one of these offences, the offender was masturbating himself and intermittently forcing the victim to masturbate him too. In other cases, the offender would masturbate himself to the point of ejaculation after raping the victim.

Other behavioural studies have found similar percentages of this behaviour; Häkkänen et al., (2004) found that 9% of their sample involved the offender masturbating himself with his hand, whilst Woodhams (2008) found a slightly lower percentage of 7.7%.

5.3.1.55 Sat or laid

The offender sat or lay down beside the victim (not as part of the sexual act) in six cases (5.4%). Example of this include one offender laying next to the victim in bed after raping her and falling asleep and another sitting next to her post-rape and asking her questions about herself. Again other studies have not necessarily measured this behaviour; Woodhams (2008) did however, finding a similar percentage of 5.1%.

5.3.1.56 Tobacco smoked

The offender smoked tobacco in six cases (5.4%). In one of these cases, the offenders were smoking during a robbery that took place before one of the offenders raped the victim. N two cases, the offender was "constantly smoking" during the offence; in these, the offences took place outside in isolated areas. In three cases, all in indoor locations, the offender smoked cigarettes after the rape, sitting down with the victim and, in all of these locations, both the victim and the offender smoked.

The present author could not find behavioural studies that examined the levels of the offender smoked during the offence, although Grubin et al., (2001, p.64) did report that some of the offenders had smoked in their initial UK variables.

5.3.1.57Alcohol drank

In five cases (4.5%), the offender drank alcohol during the offence. In one offence, the offender brought a bottle of vodka to the scene (victim's house) and drank it throughout the offence. Another was carrying a bottle of gin when the victim was attacked by him, another offender drank a can of beer, whilst one offender who abducted a victim from the

street and held her in his house, drank beer. Finally, a group of offenders, who congregated in a park when the victim walked past them, were also drinking beer.

Research into the relationship between alcohol and sexual offending has long been carried out (for a summary see Finney, 2004). Mostly, the research reports how offenders will often be intoxicated or have been drinking immediately before drinking or will have an alcohol dependence (Grubin & Gunn, 1990). Although alcohol consumption has been found to occur most often between offenders and victims who know each other (Koss, Dinero, & Seibel, 1988), some behavioural studies that examine stranger rape specifically have found that the some offenders were intoxicated at the time of the offence. Häkkänen et al., (2004), for example, found that 54% of offenders within their sample were under the influence of alcohol at the time of the offence.

Within the present study, only occasions when the victim saw the offender drinking were recorded within this category. Therefore, in offences where the victim could smell alcohol on the offender's breath but did not see him drinking were not coded for *Alcohol drank*. This is because the emphasis of this chapter is to measure only behaviours that were observed within the offence rather than examining what may have occurred beforehand. Woodhams (2008) found that 2.6% of the non-serial stranger rape sample had involved the offender consuming alcohol with the victim.

5.3.1.58 Blindfolded hand

In five cases (4.5%), the offender placed his hands over the victim's face so that she could not see. In all, this was carried out during the offence, as the victim struggled, as if to overpower her. Behavioural studies do not measure the extent to which the offender covered the victim's eyes with his hands. However, Woodhams (2008) does report this, with a similar percentage of 2.6%.

5.3.1.59 Bound

The offender bound the victim in five cases (4.5%). In all these cases, the materials used to tie the victims were found at the scene itself. In one, the offender used rope that was in his own house (the attack location). Three of these crimes occurred at the victim's house. In these, the offender either used the victim's clothes, a cord from a bedside lamp or wires from her telephone to tie her up. In one case, where the offender had attacked the victim outside, he burnt the chord from her sweat top and tied her hands behind her back. The binding of the victim seemed to occur at two different points in the attack. Some offenders

bound their victim in order to restrain them during the rape; others bound the victim after the attack to slow down their escape; others did both. Offenders who bound the victims do so either by the arms (i.e. behind the victim's back) or by the legs. There were no cases where the offender seemed to be sexually aroused by the act of tying up their victim.

The percentages of binding present in other studies vary in size. Alison and Stein (2001), for example, found a much higher percentage of this behaviour than the present study, at 20%. Canter et al., (2003) found that the offenders had bound the victims in 14% of offences; whilst Greenhall and West (2007) found that their offenders had bound or gagged victims in 12% of cases. The differences may be due to the perhaps more 'serious' nature of the samples studied in these (that is, police forces selected out particular offences in the Alison & Stein, 2001 and Canter et al., 2003 studies and the offenders within the Greenhall & West, 2007 studied were detained in a high secure hospital). However, other studies using similar data sets have found percentages that are similar to the current study; Canter and Heritage found 7.58%, whilst Häkkänen et al., (2004) found less than 1% within their sample. It could be, therefore, that binding behaviour may depend on the availability of materials to bind the victim at the offence location.

5.3.1.60 Endearment term

In five cases (4.5%), the offender referred to the victim with a term of endearment. Usually, this phrase was 'babe' or 'baby' (in three cases). When using this term, the offender was either making comments of enjoyment whilst raping the victim (for example, 'yeah baby'), reassuring her ('it's ok baby, it'll be alright') or the suspect 'kept calling her babe.' In one case, the offender called the victim 'my little princess' whilst telling her not to worry. Finally, one offender referred to the victim as 'darling' when making a confidence approach.

The present author is not aware of other studies that record the level of this type of verbal behaviour; however, Davies (1992) recognises that the offender will sometimes express affection by telling the victim he loves her. Grubin et al., (2001) also acknowledges that some offenders will show affection, although the percentage of this is not given.

5.3.1.61 Joked or laughed

There were 4.5% of offenders who seemed to be making jokes or laughing at the victim. In most of these cases, the victim reported how the offender "laughed" at them; other cases include those with multiple offenders where the offenders laugh together, with one victim reporting how "it seemed like a joke to them."

The only study that present author could locate that dealt with the offender laughing at the victim was Woodhams (2008). Here, a similar percentage was shown, 5.1%.

5.3.1.62 Non-alcoholic drank

The offender drank non-alcoholic drinks in five cases (4.5%). These included an energy drink, orange juice, tea and two instances of coffee. In the latter cases, there was one where the victim made coffee for the offender. There were no cases where the victim recalled the offender eating.

To the present author's knowledge, there are no studies of stranger rape where the offender is noted to have drunk a non-alcohol drink.

5.3.1.63 Offered assistance

The offender offered the victim some kind of assistance in five (4.5%) cases. This included offences where he would pick up or help her with her bags at the beginning of the offence, helped her get up after he had raped her and helped her walk when she was unsteady on her feel.

This percentage is slightly lower than the 12.8% found in Woodhams (2008) which measured this type of behaviour.

5.3.1.64 Television or radio

In five cases (4.5%), the offender turned on the television or radio during the offence. In one of these cases, he turned on both, seemingly to mask any noises that the victim would make. In two offences, in the suspect's house, the victim recalled that the television was on, but she was not forced to watch it. Lastly, in another case, the offender forced the victim to watch television with him.

The present author could not locate behavioural studies which directly measured whether the offender had switched on the television or put the radio on. It may be that studies that examine whether the offender extended his time with the victim could include the offender making the victim watch television (for example, Häkkänen et al., 2004).

5.3.1.65 Cared loved or liked her

The offender told the victim he cared for, liked or loved her in four cases (3.6%). To this author's knowledge, the level of this verbal behaviour has not been directly reported. However, as with *Endearment term*, Davies (1992) recognises that the offender will

sometimes express affection by telling the victim he loves her. Grubin et al., (2001) also acknowledges that some offenders will show affection, although the percentage of this is not given.

5.3.1.66 Commented offender sexual arousal

In four cases (3.6%), the offender commented on his own sexual arousal. In two, the offenders made comments of enjoyment whilst they were raping the victim; one kept repeating "yeah, baby, another, "lovely, lovely, lovely." Two offenders stated that they were feeling "horny"; one seemingly justifying his behaviour stating "I'm just horny", the other announced "I am feeling horny."

Canter et al., (2003) reported different levels of this variable, finding that this was a very highly occurring (61%). This discrepancy could be due to recording differences; indeed within the present study, it was ensured that the coding of offender sexual comment did not relate to general sexual commands like 'suck it' or 'take your knickers off'; these were classified as orders. Within Häkkänen et al., (2004), there were separate variables which covered commands such as these (for example, forcing the victim to undress), whilst Canter et al., (2003) broadly defined this variable as referring to 'the offender making sexual comments during the attack.' This variable may be, therefore a 'catch-all.'

5.3.1.67 Directed co-offender

The offender directed a co-offender in four cases (3.6%). In one case, one offender told another offender to "hurry up", in another the offender told his co-offender "It's my turn." Similarly, in one case, one offender told the other to "go away" and leave them for "10 minutes." Lastly, having raped the victim, one offender told the other to look after the victim and "do whatever he wanted."

Woodhams (2008) reported a similar figure of 5.1% when examining the directions offenders made to their co-offenders.

5.3.1.68 Held hand

The offender held the victim's hand in four cases (3.6%). In two of these cases, this behaviour was exhibited during the offence, with the offender taking the victim by the hand and leading her to another location. In a further two cases, the offender held the victim's hand after the offence, whilst he walked her to the release location.

As with the variable *Cuddled*, previous studies do examine the ways in which the offender expresses affection towards the victim, which may includes hand holding (for example, Davies, 1992). Rarely do behavioural studies specifically measure whether the offender held the victim's hand. An exception is Woodhams (2008) who found a similar percentage as the present study, 2.6%.

5.3.1.69 Liar

The offender accused the victim of lying to him in four cases (3.6 %). This occurred more often when the victim had either told the offender that she did not have any money or items to steal or when the victim directed the offender to a place where an item was (for him to steal) and the offender could not find it.

The only study the present author could locate that specifically measures the level of this behaviour; Woodhams (2008) found 5.1%, which is comparable to the present study.

5.3.1.70 Redressed victim

The offender redressed the victim in four cases (3.6%). This has not been measured widely in the literature; however, Woodhams (2008) found that within a sample of group rapes (n = 14), 7.1% of offences included the offender redressed the victim (as opposed to ordering her to redress).

5.3.1.71 Talked to himself

In four cases, (3.6%), the offender seemed to talk to himself. The extent to this varied, with some offenders telling themselves to "speak English" or berating themselves for not being able to penetrate the victim ("fuck it"), whilst others seemed to be continually doing so. One victim reported how the offender "was talking to her and the next it was as if he was talking to someone else." Another offender was asking himself questions. The present author could not find measurement of this in other behavioural studies.

5.3.1.72 Allowed to leave

The offender allowed the victim to leave the crime scene (as opposed to other exit methods) in three cases (2.7%). In one, the offender allowed her to leave the ditch that he had raped her in; in the two others, the offender allowed the victim to leave his house.

5.3.1.73 Anal digital

In three cases, (2.7%), the offender penetrated the victims' anus with his finger. In all of these offences, this action was part of multiple penetrations by the offender, both penile and digital. Not all behavioural studies isolate this variable on its own; rather, they report anal penetration which could include digital penetration.

5.3.1.74 Attracted attention

The offender beckoned, whistled or shouted only a short phrase (for example, 'hey') at the victim to attract her attention in three cases (2.7%). Behavioural studies do not frequently report this behaviour, and it may be included within the confidence approaches. However, Woodhams (2008) did measure this, reporting a much higher percentage than the present study of 25.6%. It is not clear why these percentages are so different, as the Woodhams (2008) study did not specify the exact nature of this behaviour.

5.3.1.75 Boasted

In three cases (2.7%), the victims reported that the offenders boasted to the victims. In one case, the victim reports how the three offenders were all "happy and boasting." In another case, the offender bragged about his sexual prowess, another offender boasted about his popularity. Boasting is seldom measured in behavioural studies, although it could be that examples of this could be categorised under self-disclosure or when the offender revealed his personal details. However, Grubin et al., (2001) do refer to the boasting variable, although it is not clear in how many cases this occurred.

5.3.1.76 Commented penis

In three cases (2.7%), the offender commented on his penis. In two of these, the offender told the victim that his penis was "lovely" and "gorgeous". In the other, the offender made the victim touch his penis, stating "you'll love this."

Past behavioural studies do not isolate this variable but instead use a more general category of the offender making sexual comments. For example, Alison and Stein (2001) report how 57% of their non-serial stranger rape sample involved the offender making sexual comments, whilst Canter et al., (2003) reported a slightly higher percentage of 61%. The higher percentages of these studies compared with the present study is due to the more general nature of their category.

5.3.1.77 Drugs smoked

There were three cases (2.7%) where the offender smoked drugs in the offence. In two, the victim recalled how the offender smoked cannabis, whilst in another the offender was smoking a "crack pipe."

Not many behavioural studies measure whether the offender smoked or took drugs with the victim. However, Woodhams (2008) did so, finding a very similar percentage of 2.6%.

5.3.1.78 Gloves

In 2.7% (3) of the cases offenders wore gloves or similar items, occurring only when they broke into a house to offend. Two victim recalled how the offender was wearing gloves whilst another victims remembered that the offender put socks on his hands (from the victim's dressing table) before he touched her. This behaviour seemed to indicate that the offender did not want any fingerprint evidence to be found at the scene.

The wearing of gloves, as a separate variable, is not always recorded within behavioural studies of stranger rape. Other studies tend to include this within a general variable such as 'forensic awareness' (12% in the serial rapes within Alison & Stein, 2001). However, Woodhams (2008) specifically measured the wearing of gloves and found a similar percentage (2.6%) to the present study. Another study using serial rape offences (Grubin et al., 2001) cited a slightly higher percentage of wearing gloves (9%).

5.3.1.79 Left weapon

The offender left his weapon at the scene in three cases (2.7%). This is similar to another study identified as having measured this; Woodhams (2008) found 2.6% within a non-serial stranger rape sample committed by juvenile offenders.

5.3.1.80 Made phone call

During three offences (2.7%), the offender made a phone call during the offence. This behaviour is not directly measured in behavioural studies and may come under self-disclosure/reveal variables.

5.3.1.81 No hear

Another drawback of some accounts of the rapes was that the victim could not hear what the offender was saying or they had difficulty remembering what the offender was

saying. This occurred in three cases (2.7%). In two, the victims could not remember what the victim said; in the other, the victim was deaf and therefore could not hear the offender's speech at all. The implications of this are discussed in the Chapter Summary.

5.3.1.82 Ordered comment sexual

The offender ordered or asked the victim to comment on his penis or his sexual 'performance' in three cases (2.7%). This is different from the offender asking the victim to say specific words or phrases (*Scripting verbal*). In two cases, the offender asked the victim to comment on his penis. In the other, he asked her whether she thought it was small; in the other, the offender asked her what she thought of it, asking whether it was big.

Most behavioural studies have shown similar low levels of this behaviour, ranging from 4% (Canter et al., 2003) to 8% (Häkkänen et al., 2004). However, a much higher percentage was found in Canter and Heritage (1990), who found that the victim was forced to verbally participate in the attack in 25.8% of the cases. This variable may cover other behaviours separately considered within this study, for example, making the victim say specific phrases or words (*Scripting verbal*).

5.3.1.83 Placed pad

The offender placed an item of clothing underneath the victim in three cases (2.7%). In two, he placed his jacket on the ground and told the victim to lie on the jacket. In the other, the offender used the victim's coat. The only study that that uses this variable and, therefore can be directly compared to the present study is Häkkänen et al., (2004), who found that the offender placed a pad for the victim to lie down in 4% of cases; a similar percentage. Other studies use a broader category which describes how the offender will offer assistance to the victim; Woodhams (2008) recounted how 12.8% of the non-serial offences contained the offender displaying this kind of behaviour. However, it is not clear what types of assistance this was.

5.3.1.84 Swallowed

The offender forced the victim to swallow his semen in three cases. The present author has not found this behaviour measured in other behavioural studies, although it may be included when researchers code for victim participation.

5.3.1.85 Testicles in mouth

In three cases, the offender forced the victim to place his testicles into his mouth. Similar to the above study, this has not been reported in other studies; although other studies may include this is forced participation or fellatio.

5.3.1.86 Scripting verbal

In three cases (2.7%), the offender forces the victim to say a specific phrase. In one case, the offender kept making the victim call him a particular name, whilst in two others, the offender forced the victim to tell her she loved him.

Behavioural studies show that this behaviour is relatively rare or not seen in detected stranger attacks; for example, Woodhams (2008) found that none of the offenders within a non-serial stranger rape sample exhibited this behaviour. It is difficult to gauge whether this behaviour is included in studies which report how the victim was forced to make sexual comments. Häkkänen et al., (2004), for example, found that 8% of their cases contained some kind of forcing the victim to make sexual comments, whilst Canter et al., (2003) a figure of 4%.

5.3.1.87 Vagina washed or cleaned

In three cases (2.7%), the offender washed or cleaned the victim's vagina. This was seemingly carried out to remove forensic evidence left by the offender. In two offences, the offender made the victim shower, in one making sure she washed herself twice. In one case, the offender wiped the victim's vagina after ejaculation.

Within behavioural studies, offenders have been found to destroy or clean away semen on the victim. Woodhams (2008) found that 7.7% of the sample was concerned with this, whilst a recent study examining 222 rape events committed by imprisoned offenders (Beauregard & Bouchard, 2010) found that 6.8% of offences involved the offender wiping away semen, and 0.5% made the victim shower after she had been sexually assaulted. These authors argue that such behaviour is increasingly common within rape offences, due to an increase of awareness of forensic science (Stevens, 2008, cited within Beauregard & Bouchard, 2010).

5.3.1.88 Cunnilingus

Cunnilingus (where the offender licks the victim's vagina) was present in 1.8% (2) of the cases. Behavioural studies reflect differences in the occurrence of this behaviour;

Häkkänen et al., (2004) relate that it occurs within 3% of cases, whilst Canter et al., (2003) and Alison and Stein (2001) report 18% and 17% of cunnilingus respectively. It is not clear why there is a disparity in the percentages between the current study compared with previous literature. It may be because the selection techniques for the data to be included in the respective study; the current study takes stranger rapes from a small period of time over a relatively localised area, whilst the Alison and Stein (2001) and the Canter et al., (2003) used particular offences that had been selected by the police or referred to a specialist behavioural unit. Therefore, there may be something qualitatively different about the rapes within these studies compared to the present one.

5.3.1.89 Phone smashed or wires cut

In two cases (1.8%), the offender made it impossible for the victim to use her phone. In one, the victim recalled how she discovered her telephone wires in her house had been cut before she was raped. In the other, the offender used the telephone wire to tie the victim up and smashed the hand set on the floor so she could not use it to call for help. This could be to ensure the offender can make good his escape or to avoid interruption (Davies, 1992).

The only behavioural study that the author found that measured this directly was Woodhams (2008) who found that 2.6% of offences within the non-serial stranger sample, similar the present study.

5.3.1.90 Meet up

In two offences (1.8%), the offender asked or wanted the victim whether she would like to meet up with him again at a later date. Some behavioural studies note that the offender can ask the victim to go on a 'date' with him (for example, Davies, 1992); Woodhams (2008) found that 7.7% of her non serial sample exhibited this behaviour, slightly more than the current percentage.

5.3.1.91 Multiple victims

There was more than one victim in two cases (1.8%), both involving two victims. Both of these cases involved one offender raping both victims. Usually, behavioural and descriptive studies examine offences perpetrated against one victim so it is difficult to gauge how the present study compares in this respect.

5.3.1.92 No speech

The offender did not speak at all during the offence in two cases (1.8%). This is relatively rare, therefore, and supports the notion that speech often plays a central and strategic role in rape offence behaviour (Dale et al., 1997; Fossi, Clarke, & Lawrence, 2005). To this author's knowledge, this is has not been measured in other studies.

5.3.1.93 Slept

In two cases, the offender fell asleep during the offence. In both, the offender had forcefully taken the victim back to his house. In both, after raping her, he fell asleep and she escaped. Again, to the author's knowledge, this behaviour has not been directly reported or measured in behavioural studies examining one-off stranger rapes.

5.3.1.94 Switched lights off

There were two cases (1.8%) when the offender switched all the lights off at the attack location.

5.3.1.95 Taxi called

The offender offered to or called a taxi or attracted the attention of a taxi driver in two cases (1.8%). In one, the offender waved a taxi down at the end of the offence and made the victim get in with him. In the second case, the offender offered to call a taxi for the victim at the end of the offence but the victim managed to get away from him before he was able to.

Other studies do not directly measure this variable but others may have coded behaviour such as this within offering assistance or extending time variables.

5.3.1.96 Torch

In two cases (1.8%), the offender brought (and used) a torch to the scene. In both cases, this was when the offender had intruded into the victim's house and the offender did not turn the lights on in the house. In both cases, he used the torch to search cupboards and drawers for items to steal. Although torches could conceivably be included in offender's rape 'kits' which would include items to commission the offence successfully (Davies, 1992), behavioural studies do not directly report or include whether torches were taken to the offence by the offender.

5.3.1.97 Blitz approach

There was one case where the offender used a blitz style approach to attack the victim. This is defined here as an immediate, injurious force (Hazelwood & Burgess, 1987). In this case, the offender used a piece of wood to knock the victim down at the beginning of the offence.

Similar to the present study, behavioural studies usually report this approach method as uncommon. For example, Ruperal (2004) found that less than 1% of all victim-offender relationship rapes included blitz attacks, whilst Canter and Heritage (1990) found 4.5%

5.3.1.98 Cleaned teeth

In one offence, the victim was forced to clean her teeth (0.9%). This behaviour may indicate that the offender has some sort of forensic awareness but has not been directly identified within behavioural studies.

5.3.1.99 Commented on own performance

This variable refers to the offender commenting on his own sexual 'performance' and occurred in one case (0.9%). In this offence, the offender told the victim that he would "do it well." This is different from general boasting (see the *Boasted* variable) where the offender boasted generally about himself; this variable specifically refers to the offender's sexual performance.

5.3.1.100 Hair covered

In one offence, the offender covered his hair with a sock before raping the victim. Again it is thought that this may show that the offender did not want any of his hairs to be found on the victim, and therefore, may indicate that he is forensically aware. However, this variable is not directly measured or reported in other behavioural studies.

5.3.1.101 Look out

In offences where there was more than one offender, there was one instance where one of the offenders was acted as a look out whilst the other carried out the offence. In this case, one offender robbed the victim and then moved away to act as a look out when the other offender raped her.

5.3.1.102 Marry

One of the offenders offered to marry the victim. This verbal behaviour is not usually measured within behavioural studies, although Davies (1992) acknowledges that has been seen in some serial sex offenders, in an attempt to lengthen the victim-offender 'relationship.'

5.3.1.103 Observed

The rape was observed by a co-offender in one case (0.9%). Here, one offender stood to the side of his co-offender, who raped the victim. Woodhams (2008) reported that this behaviour occurred in 2.6% of cases within a non serial juvenile offender sample.

5.3.1.104 Offered pay

The offender offered to pay the victim in one case, stating "I will pay you, how much do you want?" The present author is not aware of other studies that have identified this behaviour.

5.3.1.105 Ordered comment non-sexual

The offender ordered the victim to make a non-sexual comment in one case. In this instance, he ordered the victim to comment on his shoes. This is different from asking non-sexual questions because, in this case, the victim was forced to tell the offender what she thought of them, rather than the offender generally being inquisitive about the victim. As far as the present author is aware, the frequency of this verbal behaviour has not been reported in previous studies.

5.3.1.106 Spat

The offender spat in one case (0.9%). Here, he spat at the victim at the end of the offence. Although the other behavioural studies have examined how the offender can demean the victim (see *Verbal abuse*), the present study could only identify one other study that involved non-serial stranger rapists that examined spitting as a variable. Woodhams (2008) described how 2.6% of offenders adopted this behaviour, a percentage that is similar to the present findings.

5.3.1.107 Spat hand

The offender forced the victim to spit on his hand in one case. This was to make his subsequent penetrative behaviour 'easier.' Such a variable may be included within forcing

participation variables (for example, Canter et al., 2003). However, this has not been directly reported in previous studies.

5.3.1.108 Stole underwear

In one case, the offender stole the victim's underwear. Stealing underwear may be more indicative of fetishism or deviant fantasies (Davies, 1992). However, this variable is not directly measured within behavioural studies.

5.3.1.109 Requested help

The offender requested the victim help him in one case. In this case, the offender asked the victim not to call the police. Woodhams (2008) found that a much higher percentage of this variable; 20.5%

In summary, the 112 victim statements yielded a rich description of the behaviours exhibited within the offences. Most of these have been found within descriptive and behavioural studies in the past. However, a few behaviours are unique to this data set and add to the picture of rape within this localised area.

The next section examines how these behaviours co-occurred within the sample, and considers whether similar themes emerge.

5.4 A model of behaviour

5.4.1. Smallest Space Analysis

To test whether the offence behaviours could be differentiated into the hypothesised themes, the statistical technique of Smallest Space Analysis (SSA-1, Lingoes, 1973), a multivariate data reduction procedure, was conducted on all 112 cases. The SSA was used to explore the co-occurrences of the rape behaviours and allowed for the testing of the hypothesis that the behaviours could be differentiated into themes. The SSA plot is derived from an association matrix of Jaccard's coefficients, which is a measure of association that does not take into consideration joint non-occurrences (Jaccard, 1908, from Canter et al., 2003). It was decided that this was the most appropriate measure of association to use for this type of data, as an observed '0' for a particular behaviour does not mean that the behaviour definitely did not occur. As Canter et al., (2003) suggest, the nature of using such archival material such as police data, renders it impossible to verify particular information.

Figure 5.4.1 shows the Smallest Space Analysis of the offence behaviours in all 112 of the stranger rape cases.

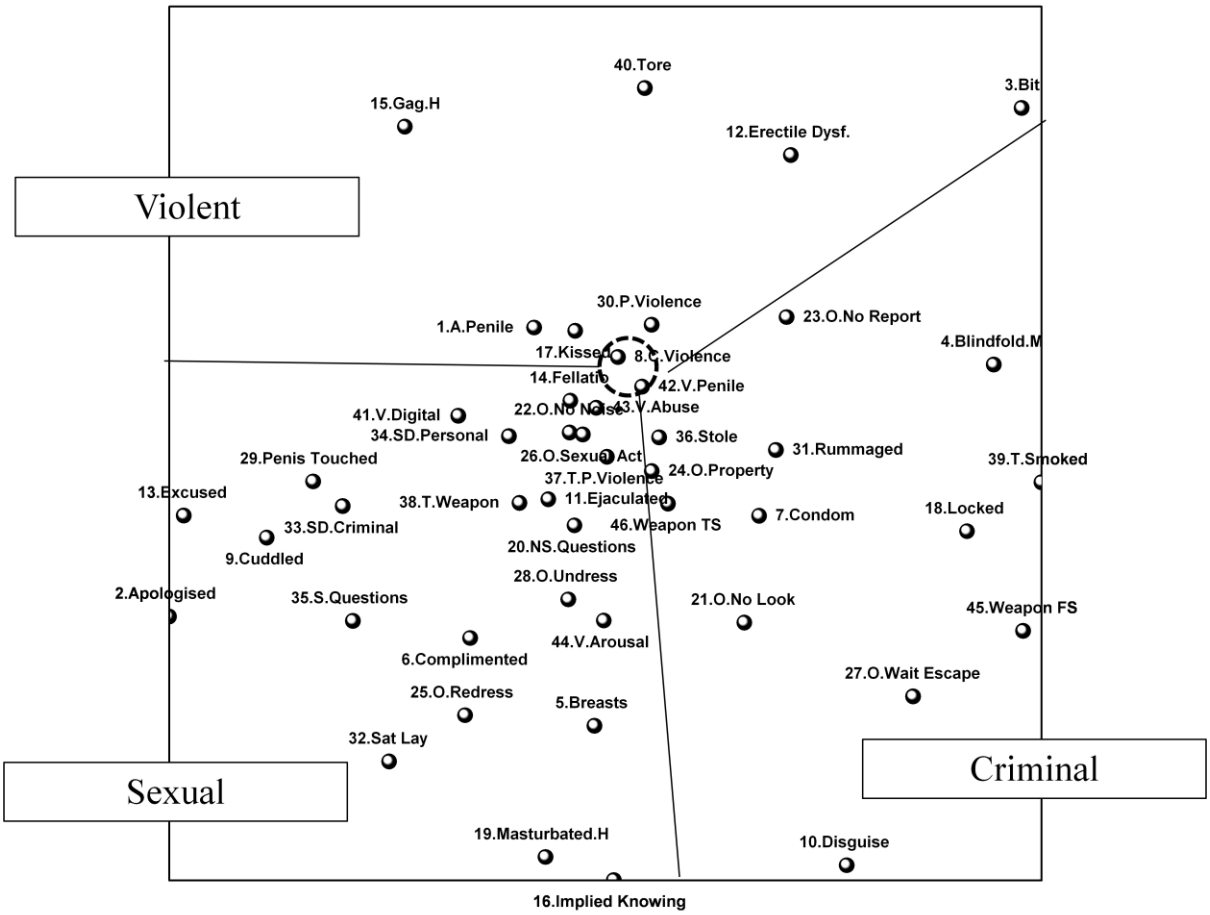


Figure 5.4.1 Smallest Space Analysis of offence behaviours (N = 112)

Key: 1x2 solution of a 2 dimensional plot; Coefficient of alienation 0.29 in 40 iterations.

1. Anal penile (19.6)	17. Kissed (35.7)	32. Sat or laid beside victim (5.4)
2. Apologised (5.4)	18. Locked in (8.9)	33. Self-disclosure criminal (7.1)
3. Bit (5.4)	19. Masturbated hand (5.4)	34. Self-disclosure personal (28.6)
4. Blindfolded material (8.9)	20. Non sexual questions (19.6)	35. Sexual questions (6.2)
5. Breasts (9.8)	21. Ordered no look (10.7)	36. Stole property (40.2)
6. Complimented (9.8)	22. Ordered no noise (42.0)	37. Threatened physical violence (33.9)
7. Condom (14.3)	23. Ordered no report (13.4)	38. Threatened weapon (20.5)
8. Control violence (86.6)	24. Ordered property (25.0)	39. Tobacco smoked (5.4)
9. Cuddled (8.0)	25. Ordered redress (8.9)	40. Tore clothing (9.8)
10. Disguise (5.4)	26. Ordered sexual activity (50.0)	41. Vaginal digital (17.0)
11. Ejaculated (33.0)	27. Ordered wait escape (6.2)	42. Vaginal penile (71.4)
12. Erectile dysfunction (8.9)	28. Ordered undress (17.9)	43. Verbal abuse (25.0)
13. Excused or justified (5.4)	29. Penis testicles pubic hair touched masturbated (8.9)	44. Victim arousal (12.5)
14. Fellatio (42.9)	30. Physical violence (33.9)	45. Weapon from scene (6.2)
15. Gagged hand (16.1)	31. Rummaged (14.3)	46. Weapon to scene (25.9)
16. Implied knowing (7.1)		

The two-dimensional solution is shown in Figure 5.4.1.The Guttman-Lingoes coefficient of alienation for this solution was 0.29 in 40 iterations. As a general rule, the better the fit of the original association matrix and the SSA plot, the smaller the coefficient of alienation (Canter & Heritage, 1990). Indeed, this coefficient of alienation is slightly higher than that of some other behavioural studies (0.22 in 16 iterations, in Alison & Stein, 2001; 0.24 in 37 iterations in Canter et al., 2003). However, as Shye, Elizur and Hoffman (1994, p.125) state 'in the past it has been customary to attempt SSA solutions of increased dimensionality when the coefficient was considered high...This procedure has, however, been found lacking both on technical and theoretical grounds [since] the coefficient of alienation is sensitive to the number of items processed" (from Alison & Stein, 2001, p523). Canter and Heritage (1990), for example, presented a coefficient of alienation of 0.22 in 22 iterations for their original three-dimensional SSA plot but, instead displayed a two-dimensional version with a coefficient of alienation of 0.30 in 11 iterations because the regional structure between the two was the same. Therefore, as this was the case within the present study, and the interpretation if the inter-relationships between the variables, and the empirical structure of the plot is key (Laumann & Guttman, 1966), this two-dimensional plot and subsequent coefficient of alienation was considered satisfactory.

5.4.2 Interpretation of the Smallest Space Analysis

An examination of the SSA plot allowed for the underlying empirical structure of the rape behaviours to be examined. Each point on the plot represents one of the offence behaviours; the closer any two points are together in space, the more likely they are to co-occur within the rape sample. As hypothesised, the SSA plot could be partitioned into three themes; Criminal, Sexual and Violent, as well as having a core of central behaviours. Partitions were made onto the plot by examining the proximity of variables to each other and considering the semantic similarities they have with one another. Previous literature relating to the theory behind rape behaviour as well as previous research examining the behavioural structure of rape (as outlined in Chapter One and the Introduction to this chapter) helped inform these decisions. As per Alison and Stein (2001), partitioning of behaviours that were on the edge of a region was guided by the Kuder-Richardson 20 (K-R 20) values of regions with or without these variables. If the internal reliability of a region was greater with these variables, then they were included within that particular region. If they were greater within the other region, then they were included in that region.

The K-R 20 values for the regions were as follows: Criminal = 0.59, Sexual = 0.79, Violent = 0.22. The values for the Criminal and Sexual regions are in line with other SSA studies examining rape behaviour (such as Alison & Stein, 2001) suggesting that they are high enough to ensure the regions are "meaningful and coherent" (Alison & Stein, 2001, p.217). The Violent K-R 20 value is lower than usually found in such studies, suggesting that there may be issues with the internal reliability of the Violent region. However, with careful consideration of the variables within this region and the examination of whether these variables would be best placed within other regions in the plot, it was decided to keep this region as separate. The K-R 20 value is sensitive to the number of items within the analysis, and as this region only includes seven variables, this will have influenced this measurement (Häkkänen et al, 2004). Also, as Canter et al., (1998) suggest the gaps in the plot where there are no variables may be of interest. Therefore, as the Violent region of this plot has many such gaps, it could be argued that the current sample does not have particularly violent behaviours that could be plotted within this region. Simply, the sample studied was not 'violent enough' to populate this region with particularly violent behaviours. Perhaps drawing from a more 'violent' set of offenders would ensure that this region would have a higher number of different kinds of variables. This warrants further study. These K-R 20 values are not high enough to show that the behaviours are indicative of an increasing scale of criminality, sexuality or violence (Alison & Stein, 2001) but, as this is not the purpose of carrying out the SSA within this chapter, the values of the K-R 20 are informative rather than crucial.

In terms of the predictions made about within which theme offence behaviours would be found, seven out of the 46 offence behaviours did not lay within the hypothesised regions. These variables will be considered shortly. The core behaviours and each theme will be discussed below.

5.4.2.1 Core behaviours

Control violence and *Vaginal penile* were both central features within the plot and it was deemed that they were not part of any particular region. This is because they were in such high frequency within the sample (86.6% and 71.4% respectively) it was thought that they were focal aspects for the majority of the rapes. Therefore, in order to control the victim enough so as to overpower her, a great deal of the offenders needed to use this method of violence (tripping, pushing, grabbing, pulling) in order to do so. This variable is in such high frequency, that it was thought that it could not be used to readily discriminate between

different types of offence behaviour. Similarly, *Vaginal penile* was also a focal aspect of the rapes, a similar finding to that of other studies such as Canter et al., (2003). This is not surprising, as attempted or achieved vaginal penetration is one of the main reasons (as well as other penetrations) why the rape was classified as a rape by the police in the first place.

5.4.2.2 Criminal region

Twelve variables were found in the Criminal region of the plot. These were: *Blindfolded material*, *Condom*, *Disguise*, *Locked in*, *Ordered no report*, *Ordered property*, *Ordered wait escape*, *Rummaged*, *Stole property*, *Tobacco smoked*, *Weapon from scene*, *Weapon to scene*. All of these variables (except *Tobacco smoked*) were predicted to fall within this region as they were either necessary for the successful commission of the offence (for example, locking the victim in, using weapons and orders to control the victim), they indicated that the offender wanted instrumental gain in addition to the gain of raping itself (for example, stealing items, looking for items to steal), they indicated that offender was forensically aware (for example, hiding his face, using a condom).

The way in which these variables have 'mapped' onto the Criminal region within the SSA plot, supports previous research studies that have also considered these variables (as outlined within Table 5.2.4).

5.4.2.3 Sexual region

There were 23 variables within the Sexual region of the SSA plot. These were, *Apologised*, *Breasts*, *Complimented*, *Cuddled*, *Ejaculated*, *Excused or justified*, *Fellatio*, *Implied knowing*, *Non sexual questions*, *Ordered no noise*, *Ordered redress*, *Ordered sexual activity*, *Ordered undress*, *Masturbated hand*, *Penis testicles pubic hair touched*, *Sat or laid beside victim*, *Self-disclosure criminal*, *Self-disclosure personal*, *Sexual questions*, *Threatened physical violence*, *Threatened weapon*, *Vaginal digital*, *Victim arousal*, *Verbal abuse*. Out of these variables, four had not been predicted to lie within this region.

Ordered no noise was predicted to be part of the *Criminal* region. This was because it was thought it was a way in which the offender could 'successfully' carry out the offence by controlling the victim. Indeed, Woodhams (2008) had categorised this within the Escape domain within her sample of non serial juvenile offenders. This variable was highly frequent, in relation to other variables (46%) and co-occurred frequently with the other Sexual behaviour *Ordered sexual activity*. It was thought that this behaviour fell into this region of the plot because it was very often used within sexual orders (in 61.7% of cases where

Ordered no noise was used, it was coupled with *Ordered sexual activity*). Therefore, it was thought that this variable was used in order to successfully commission the sexual activity that the offender wanted to carry out.

Likewise, *Threatened physical violence*, *Threatened weapon* and *Verbal abuse* also formed part of the Sexual region. The two former behaviours were hypothesised to be part of the Criminal region, whilst it was thought that the latter behaviour would be part of the Violent region. Again, these offence behaviours co-occurred with Ordered sexual activity (this co-occurred with 71.9% of cases where *Threatened physical violence* occurred, 69.6% of cases where *Threatened weapon* occurred, and 71.4% of cases where *Verbal abuse* occurred). Therefore, it was thought that offenders were using these methods (which were threats, not necessarily followed with the violence or the weapon), to ensure that the sexual activity they were ordering was carried out.

All other variables mapped onto this region as hypothesised. These behaviours were considered to be Sexual as they seemed to represent the offender's attempts of striking up a pseudo-intimate encounter (asking questions, disclosing personal information, trying to explain the reasons why he had raped her, showing signs of affection) but also seemed to be indicative of sexual motivation, to force the victim to give the offender sexual pleasure.

5.4.2.4 Violent region

There were seven variables within the *Violent* region. These were: *Anal penile*, *Bit*, *Erectile dysfunction*, *Gagged hand*, *Kissed*, *Physical violence*, *Tore clothing.* Out of these variables, three had been predicted to be part of different regions.

It was thought that *Erectile dysfunction* should have been part of the *Sexual* region. This was because it had been part of the Sex domain within Grubin et al., (2001) and within Sexual and Personal gratification within Davies (1992). This behaviour could be related to other violent behaviours perhaps because of the increasing frustration the offender felt towards the victim as he was unable to sustain and maintain an erection. The reasons why this behaviour could be conceived as violent warrants further study.

Gagged hand was originally thought to be a *Criminal* region, due to previous research and because it was a method to stop the victim screaming and thus, increasing the chances that the offender will 'successfully' complete the offence. However, the majority of previous studies have measured gagging as the offender using material to stifle the victim's cries (for example, Canter et al., 2003). The behaviour exhibited within this study was slightly different; often the offender would 'stuff' his hand right into the victim's mouth, often

restricting her breathing. This behaviour, therefore, might well be seen as more of a violent, excessively, aggressive act, rather than one that is 'just enough' to control the victim in order to overpower her.

Kissed also formed part of the *Violent* region. Previous studies have emphasised that this behaviour is one which is indicative of a pseudo-intimate theme, with the offender kissing the victim as he would within a 'normal' relationship (for example, Canter et al., 2003). Almond and Canter (2007) also found that kissing was more of an aggressive act within their sample of juvenile sex offenders (age range, 9-18 years). This variable is on the edge of the partition with the Sexual region and so, it is clear that, in some cases, the behaviour will be more of an aggressive act, and in others, it will be more pseudo-intimate.

The other variables mapped on to the Violent region as expected. These are behaviours that are thought to be violent (excessive acts of violence), sexually aggressive (penetrating the victim anally), with sadistic undertones (biting the victim) and show evidence of more of a frenzied attack (tearing the victim's clothing). As stated previously, the "gaps" in this region, and low K-R score, may be indicative of the nature of the sample; these offences are a cross-section of all rapes within a particular time period, over a localised area. They were not chosen because of the particular sample they represent (for example, prisoners within a high secure prison or incarcerated serial rapists) and, therefore, apart from the rape itself (which is considered an extremely serious sexually violent act), few extreme instances of extreme physical violence were seen within the sample.

5.5 Chapter summary

This chapter examined the offence behaviours within the rapes. Firstly, the levels of particular offence behaviours were examined and compared with past research. A range of both verbal and non-verbal behaviours were exhibited within the offences, ranging from high frequency behaviours such as using violence to control and vaginal penetration, to low frequency behaviours such as requesting help and cunnilingus. In comparison to previous research, differences in the levels of such behaviour can be related to varying sampling strategies, such as using data drawn from different countries other than the UK, or in different parts of the UK, using data from offenders who have been convicted of their crimes or are detained within a secure hospital.

The second aim of this chapter was to establish whether these could be differentiated into themes. Using Smallest Space Analysis, the results showed that the offence behaviours could be split into the themes of Criminal, Violent and Sexual. These themes are repeatedly

found within studies of rape behaviours. The *Criminal* theme was exemplified by control and theft behaviours such as stealing, rummaging for items to steal, ordering the victim to give him property to steal, use of a weapon as well as showing a level of forensic awareness and 'safety' procedures, such as the use of a condom, wearing a disguise, locking the victim in, and ordering the victim to wait in particular place until he had safely escaped. Other authors have also found such a theme within similar studies; for example, Canter and Heritage (1990)'s Criminality theme, Davies (1992)'s Modus Operandi aspect, Alison and Stein (2001)'s Dominance theme, Canter et al., (2003)'s Theft and Control themes and Häkkänen et al., (2004)'s Theft theme. Such a theme bears resonance to those found in motivational classification systems such as Groth (1969), who postulated that rape was an attempt for subjugation and power over others and also to ideas that offenders rape as an extension to their overall criminality and that they are often motivated by instrumental rather than expressive goals (for example, Bartol, 1986).

The *Sexual* theme included behaviours may be indicative of pseudo-intimacy and sexual gratification. Such actions included asking the victim sexual and non-sexual questions, apologising for and excusing his actions, cuddling the victim, as well as ordering her to undress and redress, ordering sexual activities, digital vaginal penetration, sucking or licking the victim's breasts and ejaculating. Similar themes have been found in previous research; for example, Canter and Heritage (1990)'s Sexuality and Intimacy themes, Davies (1992)'s Sexual and Personal gratification as well as Attitude and Intimacy aspects of the offence, Canter et al., (2003)'s and Häkkänen et al., (2004)'s Involvement themes. Such behaviours are resonant of past theories that suggest that some offenders rape due to a need for intimacy (Marshall, 1989) or a need to satisfy sexual urges (for example, Cohen et al., 1969).

The *Violent* theme was exemplified by behaviours that were related to aggressive and hostile acts. Such actions included physical violence (such as punching and kicking), tearing the victim's clothes and biting her. Other researchers have found similar themes within rape; for example, Canter and Heritage (1990)'s Violence and Impersonal themes, parts of Davies (1992)'s Sexual and Personal gratification theme and Alison and Stein (2001)'s, Canter et al., (2003)'s, and Häkkänen et al., (2004)'s Hostility regions. Past theory has often recognised that rape can be thought of as a violent act; early motivational theories emphasised that the alleviation of aggression may be a focal drive behind rape offences (Cohen et al., 1969; Groth, 1979), whilst general theories of crime, in general, emphasise how acts can be expressively violent (Feshbach, 1964; Bartol, 1986, from Canter et al., 2003). In summary,

therefore, the themes found within the SSA showed support for underlying empirical structures, ideas about which have long been discussed within rape research.

Although the present chapter generally replicated the findings from other studies, there were seven variables that were not able to be classified in their hypothesised regions. This could be down to data recording issues or could mean that the exhibition of particular behaviours was influenced by situational factors (C/F Mokros & Alison, 2002). Equally, it could mean that the offence styles examined within this sample varied a little from other studies. Sturidsson, Långström, Grann, Sjöstedt, Åsgård, and Aghede (2006) argued that using MDS techniques such as Smallest Space Analysis to examine the structure of rape behaviour is limited as they failed to replicate the findings from studies such as Canter et al., (2003). Here, however, it is argued that such a structure has been replicated to an acceptable standard, as only seven of the 46 offence variables could not be classified within the 'correct' region.

Researchers such as Canter (2000) argue that examining offence behaviour in term of the themes exhibited is a 'better' starting point for the task of offender profiling. As he states, "Any one criminal action may be unreliably recorded or may not happen because of situational factors. But a group of actions that together indicate some dominant aspect of the offenders' style may be strongly related to some important characteristic of the offender" (Canter, 2000, p. 41). Therefore, deriving such themes from the rape data may be an important step in trying to infer offender characteristics.

The knowledge of the levels of offence behaviour within the sample also has implications for the work of crime analysts and intelligence-led policing. This chapter has given an indication of the most and least frequent behaviours that are shown with a rape offence, which may be important information for the police. Knowing which behaviours are relatively rare might be important, in terms of differentiating between offenders (Canter, 2000). Also, this information gives an idea of the base-rates of particular behaviours, which may be important when performing tasks such as Comparative Case Analysis (Woodhams et al., 2007).

There are some limitations to this chapter. Firstly, within 112 offences, there were 13 instances where more than one offender was present during the offence. The offence behaviour within these offences may have been different than single offenders and thus, may have implications for the structure of the SSA plot. However, another SSA was run, excluding these offences and is shown in Appendix 87. Within this SSA, only three offence behaviours 'changed' regions. Instead of being in the Violent region, Physical violence was

on the cusp, just inside the *Criminal* region. Instead of being in the *Sexual* region, Breasts was now part of the *Violent* region. Finally, *Implied knowing*, part of the *Sexual* region beforehand, now became part of the *Criminal* region. Although this result is not ideal, the change in regions is minimal.

Another limitation of the findings of this chapter is that the internal reliability of the thematic regions; the K-R 20 score for the *Violent* region in particular was low. This means that, use of these themes as a scale (for example measuring how much violent behaviour was exhibited within an offence) is limited (Alison & Stein, 2001). Therefore, classifying offenders by their offence behaviour would not be ideal. However, the primary aim of this chapter was to examine the different types of offence style exhibited (rather than classifying offenders) in order (in the next chapter) to examine how contextual factors may be related to the exhibition of such actions, and that the K-R 20 scores are reliant on the number of items used within the analysis (Häkkänen, et al., 2004), this was not thought to be an important issue.

The drawbacks of using victim statements as a method to examine rape behaviour have already been noted in Chapter Two. Within this chapter, it has been noted that 2.7% of the victims did not hear particular words the offender said and that 5.4% of the offenders were talking in a language which was not understood by the victim. This brings into question the reliability of the accounts. However, considering the victims within this data set generally gave rich, thorough accounts of a phenomenon which could not easily be studied another way (Alison et al., 2002), these percentages are small.

Finally, the main limitation of examining these offence behaviours in such a way disregards the important role the situation has on the exhibition of particular actions. For example, within this study, 24.1% of the offences were disturbed by a witness or a noise. Therefore, the whole of the rapists' behavioural 'repertoire' may not have been observed. This highlights the importance of considering aspects such as the location within which the offence was committed and other spatial variables and placing offence behaviour within context. The next chapter, therefore, examines the offences and themes derived within this chapter, to further study the influence context may have on action (and, in some cases, vice versa).

CHAPTER SIX
A GEO-BEHAVIOURAL MODEL

This chapter presents a geo-behavioural model, examining the relationships between the Geo-mobility styles identified in Chapter Four, and the behavioural themes identified in Chapter Five, in response for the call for offence behaviours to be examined within context (for example, Mokros & Alison, 2002). Previous rape researchers have generally considered the relationship between journey to crime and offence behaviours (or single behaviours) (for example, Warren, Reboussin, Hazelwood, Cummings, Gibbs, & Trumbetta, 1998) or have developed geo-behavioural models, without examining the offence behaviours in great detail (Beauregard et al., 2007b). The present chapter considered how the Geo-mobility styles are related to those individual behaviours and the Criminal, Sexual and Violent behavioural themes. Chi-square analysis and Smallest Space Analysis were used to determine this. It was found that the Intruded style was related to the Criminal theme, the Ambushed and Followed styles were related to the Violent theme, whilst the Abducted style was related to the Sexual theme. Findings are discussed in terms of how environmental factors and offender behaviour may interact. The implications for offender profiling and case linkage are discussed.

6.1 Introduction

6.1.1 The importance of context

As discussed in Chapter One, contemporary personality theorists have emphasised that behaviour often results from the interaction between person and situation (Magnusson & Endler, 1977). Moreover, there is likely to be a number of "if…then" scenerios, depending on the situation at hand and an individual's reaction to it (Mischel, 1990; Wright & Mischel, 1987a). Therefore, it is thought that the exhibition of behaviours will vary across a variety of situations (Shoda, 1999). Further, research examining the consistency of offence behaviours across an offender's series has shown that different behaviours will have different levels of consistency; Bennell and Canter (2002) is one of many studies that have found that inter-crime distances remain consistently short over a series, whilst other behaviours (such as types of property stolen) are less consistent. The importance of the examination of the context within which behaviours are exhibited has been highlighted by Mokros and Alison (2002), especially in relation to the efficacy of using offence behaviours as a way of predicting offender characteristics. As Alison et al., (2010, p.120) relate whilst citing Alison et al.,

(2002), "a direct link between offender characteristics and offence behaviour (i.e. homology) is unlikely to prove fruitful without acknowledging the influence of situation."

Equally, such knowledge may prove useful for the police. LeBeau (1992) argues that by "systematically connecting the behavioural dimension with its spatial and temporal dimensions provides a different perspective on a series of crimes and presents the investigator with novel information that may hasten the arrest of an offender" (p.124).

6.1.2 Previous geo-behavioural research

Previous research into the relationship between geographical and offence behaviour had focused upon correlations between journey to crime distances and offence behaviours or types of crime. For the latter, findings show that behaviours that may exemplify a particular amount of planning can be related to distance travelled. Higher levels of planning or 'professionalism' have also been associated with longer journey to crime distances; within robbery offences (van Koppen & Jansen, 1998) and 'hard-to-solve' rapes (Santilla et al, 2007). Similarly, Warren et al., (1998) found that, when offenders brought particular items to a rape scene (for example, restraints), they tended to travel longer distances from their home base. Similarly, offenders who used vehicles within robbery (Van Koppen & Jansen, 1998) and rape (LeBeau, 1987a) have been shown to travel further to commit the offence.

In a similar vein, Davies and Dale (1995) argue that 'sophistication' can be linked to distance travelled. This implies that the more 'professional' or sophisticated the style of offence, the more likely the offender will travel further to commit crimes. In particular, offenders who showed evidence of more extensive planning, organisation and forensic awareness seemed to travel further distances than those who did not show this level of 'sophistication.' Warren et al (1998) found similar results when discovered that offenders who showed a level of planning (forced entry into the victim's premises, committed burglary and used bindings) seem to have travelled further than those who did not.

Conversely, others have found that shorter distances to crime have been found for more 'expressive' crimes; LeBeau (1987a), for example, found that offenders travelled short distance to rape offences than they did to property offences. However, Laukannen, Zappalà and Dosco (2008) found that longer distances have were associated with more 'instrumental' rapes, with offenders who stole items and wore a disguise. Within the same study, they found that offenders who committed their crimes on their own travelled shorter distances than offences committed by multiple offenders. Also, offenders who used verbal threats travelled further than those who did not.

A limited amount of research has examined the types of behaviour exhibited as a function of location type. Fisher (1980), however, found that if the location of the rape was a secluded one, then this was related to the rapist's intent to injure the victim, with the implication being that the more isolated the area was, the more violent the offence will be (from Beauregard et al., 2007b).

The model described within Beauregard et al., (2007b) went some way in explaining how geographical and behavioural elements of crimes may be related (see Chapter Four for a more detailed discussion of this model). They showed how rapes where the offender directly attacked the victim on approach and then moves them to another location (a kidnap-style attack), also involved violence or threats of violence (Outdoor Rape A and B tracks). They also found that the Home-Intrusion track attacks also involved physical violence, whilst the offenders within the Sophistication rape track use verbal strategies in order to get the victim to go with them. Lastly, the Family-Infiltrator rape track involves the offender using gifts or seduction techniques to gain access to victims.

Although this model begins to show how geographical and behavioural elements may be related, it is argued that the level of detailed of the offence behaviours exhibited within Beauregard et al., (2007b) are limited. The types of behaviour included the strategies for getting the victim to and from each crime site, as well as the hunting, victim-search and approach methods. As argued within Chapter Four, within a stranger rape investigation, the police will not know whether the type of hunting or victim-search strategy the offender will have used. Although the movement strategies and the approach methods are more easily derived from victim statements, this level of analysis does not allow for a wider range of behaviours to be examined. The Beauregard et al., (2007b) study, does not describe the types of sexual behaviours carried out, other important verbal information (such as disclosure or questioning), nor does it detail other behavioural information such as whether the offender uses a weapon or steals particular items. This could be to do with the type of data from which the study's results are based; the offender interviews were orientated towards considering the decision making process that they went through when choosing targets or locations for example. Data collected for evidential purposes (such as that held on CRIS) may be a richer source of behavioural information on the rape event, details of which the offender may not remember or choose to discuss.

6.1.3 Rationale and research questions

The current chapter aims to examine the geo-behavioural nature of the stranger rapes by examining the association between the Geo-mobility styles and both individual offence behaviours and behavioural themes. This is partly to answer the call for a more systematic examination of offence behaviours within different situations (for example, Mokros & Alison, 2002) and also to examine how contextual factors (in this case, location type and spatial mobility) can influence offence behaviour and how offence behaviour may have an impact on the spatial behaviour of offenders. In summary, therefore, the present chapter aims to:

- Examine the relationship between the Geo-mobility styles and individual offence characteristics
- Consider how the Geo-mobility styles may be related to broad behavioural themes; namely, Criminal, Sexual and Violent behaviours.

6.2 Method

6.2.1 Sample

The 112 victim statements derived from the Stranger rape sample recorded on the Metropolitan Police Service's Crime Recording Information System (CRIS) were used within this chapter. These offences were committed between May 2004 and December 2006 and had been committed by 131 offenders against 114 victims. Data recording issues (as described in Chapter Two) meant that the length of the victim statements varied. For some offences, there was more than one account of the offence by the victim; for example, this could include a statement taken when the victim came into initial contact with a police officer, an initial interview with Sexual Offence Investigation Techniques Trained Officer (SOIT), and transcripts from the Achieving Best Evidence (ABE) interview (a video-taped interview). In other cases, only the initial interview was recorded in on the CRIS record. The drawbacks of this as a source of data for analysis have previously been discussed. However, the 112 victim statements remain the main source of information for the analysis carried out within this chapter.

If there were any discrepancies found in cases where there was more than one version of events, the researcher (and coders used in the inter-reliability analysis, see below) used the last version of the offence recorded. This method was chosen as this version was likely to be the most detailed, or the account for which clarification had been sought from interviewing officer.

The 114 victims' ages ranged from 13 to 75 (*M* = 26.4 years, *SD* = 14.0 years); over three quarters of the victims were aged 30 or under (77.2%). According to the Metropolitan Police Service's ethnic appearance codes, 70.2% of victims were described as 'White European', 18.4% Afro-Caribbean, 4.4% Asian and 8.2% were described as 'Other.'

6.2.2 Procedure

The *Geo-mobility styles* derived within Chapter Four were used as variables within this chapter. These were *Intruded, Ambushed, Abducted* and *Followed*. For the purpose of this chapter, each styles was considered a variable, where the presence of the variable within an offence was coded as '1' and the absence of the variable was coded as '0.' (See Chapter Two for the rationale behind this). The particular Geo-mobility style was considered the dependent variable for this chapter. The 46 offence behaviours used within the Smallest Space Analysis (SSA) within Chapter Five were also used within this chapter. Again, the presence of the variable within an offence was coded as '1' and the absence of the variable was coded as '0.' For the purpose of this chapter, offence behaviours were considered the independent variables.

6.2.3 Analysis

6.2.3.1 Chi-square analysis

The association between each particular Geo-mobility style and the offence behaviours was examined using Chi-square analysis. This is because both the independent and the dependent variables were categorical (Pallant, 2007). Some of the 2 x 2 contingency tables violated the Chi-Square assumption that the frequency of the expected cells should be at least 10 and Fishers Exact test was conducted as an alternative (Pallant, 2007). The results of this analysis will be ordered in terms of a) the *Geo-mobility style* (*Intruded, Ambushed, Abducted* or *Followed* and b) the types of offence behaviour (as derived from the SSA; *Criminal, Sexual, Violent*). The effect sizes were measured using phi (Sheskin, 1997).

The high number of tests carried out on each dependent variable (46), increases the chance of making a Type 1 error (that is, finding an association or a significant difference from the tests when there is not one) (Howell, 2002; Pallant, 2007). To correct for this, the error rate can be divided by the number of tests to be carried out on the dependent variable. For this reason, therefore, the adjusted alpha was 0.001.

6.2.3.2 Mapping the external variables on to the Smallest Space Analysis plot

To examine how the Geo-mobility styles compared with the themes derived from the Smallest Space Analysis in Chapter Five, the styles were considered as external variables on the SSA plot. External variables are those which have "a vector of similarity coefficients" (Amar, 2005, p.163) with the coefficients on the original SSA plot. Therefore, external variables can be placed on an SSA plot, and their occurrence can be considered alongside the original variables but their presence does not affect the overall monotonicity of the plot. Equally, if more than one external variable is used, the inter-relationship between the external variables is not considered (Amar, 2005). Therefore, as the geo-mobility styles are mutually exclusive (each offence can only be classified within one of the styles), they were not able to be considered within the original plot. Considering them as external variables ensures that their relationship with the behavioural variables (and each other) does not influence their relationship with the SSA plot as a whole.

6.3 Results

6.3.1 Associations between Geo-mobility styles and individual offence behaviours

6.3.1.1 Intruded

The associations between the Geo-mobility style of *Intruded* and *Criminal* offence behaviours are shown within Table 6.3.1.1a.

Table 6.3.1.1a Percentages and Chi-square output for Intruded and Criminal behaviours

	Intruded		Test output		
Criminal behaviours	Yes	No	χ^2	*p*	ϕ
Blindfolded material	26.3	5.4	8.51	.004	0.28
No Blindfolded material	73.7	94.6			
Condom	26.3	11.8	2.70	.10	0.16
No Condom	73.7	88.2			
Disguise	5.3	5.4		1.00	0.00
No Disguise	94.7	94.6			
Locked in	15.8	7.5	1.33	.25	0.11
No Locked in	84.2	92.5			

Table 6.3.1.1a Percentages and Chi-square output for Intruded and Criminal behaviours (continued)

	Intruded		Test output		
Criminal behaviours	Yes	No	χ^2	*p*	ϕ
Ordered no look	26.3	7.5	5.82	.02	0.23
No Ordered no look	73.7	92.5			
Ordered no report	26.3	10.8	3.29	.07	0.17
No Ordered no report	73.7	89.2			
Ordered property	52.6	19.4	9.32	.002	0.29
No Ordered property	47.4	80.6			
Ordered wait escape	21.1	3.2	8.56	.003	0.28
No Ordered wait escape	78.9	96.8			
Rummaged	42.1	8.6	14.46	.00	0.36
No Rummaged	57.9	91.4			
Stole	57.9	36.6	2.99	.08	0.16
No Stole	42.1	63.4			
Tobacco smoked	15.8	3.2		.06	0.21
No Tobacco smoked	84.2	96.8			
Weapon from scene	15.8	4.3	3.55	.06	0.18
No Weapon from scene	84.2	95.7			
Weapon to scene	42.1	22.6	3.13	.08	0.17
No Weapon to scene	57.9	77.4			

As this shows, there were higher percentages of all of the behaviours (except for *Disguise*) when the *Geo-mobility* style was *Intruded*, compared to when it was not. These were: *Blindfolded material*, *Condom*, *Locked in*, *Ordered no look*, *Ordered no report*, *Ordered property*, *Ordered wait escape*, *Rummaged*, *Stole*, *Tobacco smoked*, *Weapon from scene* and *Weapon to scene*. There was one significant Chi-square result, using the adjusted alpha level. This was *Rummaged* ($\chi^2 = (1) = 14.46$, $p < .0001$). Most phi values were low, signifying low effect sizes (Cohen, 1988), except for the *Rummaged* association which was approaching moderate at 0.36.

The associations between the *Geo-mobility* style of *Intruded* and *Sexual* offence behaviours are shown within Table 6.3.1.1b.

Table 6.3.1.1b Percentages and Chi-square output for Intruded and Sexual behaviours

Sexual behaviours	Intruded		Test output		
	Yes	No	χ^2	*p*	ϕ
Apologised	10.5	4.3		.27	0.10
No Apologised	89.5	95.7			
Breasts	21.1	7.5	3.26	.07	0.17
No Breasts	78.9	92.5			
Complimented	5.3	10.8	0.54	.46	-0.07
No Complimented	94.7	89.2			
Cuddled	5.3	5.4		1.00	0.00
No Cuddled	94.7	94.6			
Ejaculated	26.3	34.4	0.47	.49	-0.07
No Ejaculated	73.7	65.6			
Excused or justified	10.5	4.3		.27	0.10
No Excused or justified	89.5	95.7			
Fellatio	31.6	45.2	1.19	.28	-0.10
No Fellatio	68.4	54.8			
Implied knowing	5.3	7.5	0.12	.73	-0.03
No Implied knowing	94.7	92.5			
Masturbated hand	10.5	3.2		.20	0.13
No Masturbated hand	89.5	96.8			
Non sexual questions	26.3	18.3	0.65	.42	0.08
No Non sexual questions	73.7	81.7			
Ordered no noise	57.9	38.7	2.38	.12	0.15
No Ordered no Noise	42.1	61.3			
Ordered redress	5.3	9.7	0.38	.54	-0.06
No Ordered redress	94.7	90.3			
Ordered sexual act	57.9	48.4	0.57	.45	0.07
No Ordered sexual act	42.1	51.6			

Table 6.3.1.1b Percentages and Chi-square output for Intruded and Sexual behaviours (continued)

Sexual behaviours	Intruded		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered undress	21.1	17.2	0.16	.69	0.04
No Ordered undress	78.9	82.8			
Penis testicles touched	10.5	8.6	0.07	.79	0.03
No Penis testicles touched	89.5	91.4			
Sat or laid beside victim	5.3	5.4		1.00	0.00
No Sat or laid beside victim	94.7	94.6			
Self-disclosure criminal	5.3	7.5	0.12	.73	-0.03
Non Self-disclosure criminal	94.7	92.5			
Self-disclosure personal	26.3	29.0	0.06	.81	-0.02
Non Self-disclosure personal	73.7	71.0			
Sexual questions	10.5	5.4	0.71	.40	0.08
No Sexual questions	89.5	94.6			
Threatened physical violence	52.6	29.0	3.97	.05	0.19
No Threatened physical violence	47.4	71.0			
Threatened weapon	21.1	20.4	0.00	.95	0.01
No Threatened weapon	78.9	79.6			
Vaginal digital	10.5	18.3	0.67	.41	-0.08
No Vaginal digital	89.5	81.7			
Verbal abuse	42.1	21.5	3.57	.06	0.18
No Verbal abuse	57.9	78.5			
Victim arousal	31.6	8.6	7.62	.01	0.26
No Victim arousal	68.4	91.4			

As this shows, there were higher percentages of the following behaviours when the Geo-mobility style was Intruded, compared to when it was not: *Apologised, Breasts, Excused or justified, Masturbated hand, Non sexual questions, Ordered no noise, Ordered sexual activity, Ordered undress*, *Penis testicles touched*, *Sexual questions, Threatened physical violence*, *Threatened weapon*, *Verbal abuse*, and *Victim arousal*. However, there were no instances where the *Geo-mobility style* of *Intruded* was significantly associated with

individual *Sexual* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the *Geo-mobility* style of *Intruded* and *Violent* offence behaviours are shown within Table 6.3.1.1c.

Table 6.3.1.1c Percentages and Chi-square output for Intruded and Violent behaviours

	Intruded		Test output		
Violent behaviours	Yes	No	χ^2	*p*	ϕ
Anal penile	15.8	20.4	0.22	.64	-0.04
No Anal penile	84.2	79.6			
Bit	10.5	4.3		.27	0.10
No Bit	89.5	95.7			
Erectile dysfunction	26.3	5.4	8.51	.004	0.28
No Erectile dysfunction	73.7	94.6			
Gagged hand	21.1	15.1	0.42	.52	0.06
No Gagged hand	78.9	84.9			
Kissed	31.6	36.6	0.17	.68	-0.04
No Kissed	68.4	63.4			
Physical violence	36.8	33.3	0.09	.77	0.03
No Physical violence	63.2	66.7			
Tore clothing	10.5	9.7	0.01	.91	0.01
No Tore clothing	89.5	90.3			

As this shows, there were higher percentages of the following behaviours when the Geo-mobility style was *Intruded*, compared to when it was not: *Bit*, *Erectile dysfunction*, *Gagged hand*, *Physical violence* and *Tore clothing*. However, there were no instances where the *Geo-mobility style* of *Intruded* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

6.3.1.2 Ambushed

The associations between the Geo-mobility style of *Ambushed* and *Criminal* offence behaviours are shown within Table 6.3.1.2a.

Table 6.3.1.2a Percentages and Chi-square output for Ambushed and Criminal behaviours

Criminal behaviours	Ambushed		Test output		
	Yes	No	χ^2	*p*	ϕ
Blindfolded material	3.6	10.7	1.32	.25	-0.12
No Blindfolded material	96.4	89.3			
Condom	10.7	15.5	0.39	.53	-0.06
No Condom	89.3	84.5			
Disguise	3.6	6.0		1.00	-0.05
No Disguise	96.4	94.0			
Locked in	3.6	10.7	1.32	.25	-0.11
No Locked in	96.4	89.3			
Ordered no look	3.6	13.1	1.99	.16	-0.13
No Ordered no look	96.4	86.9			
Ordered no report	10.7	14.3	0.23	.63	-0.05
No Ordered no report	89.3	85.7			
Ordered property	28.6	23.8	0.25	.61	0.05
No Ordered property	71.4	76.2			
Ordered wait escape	0.0	8.3	2.49	.12	-0.15
No Ordered wait escape	100.0	91.7			
Rummaged	7.1	16.7	1.56	.21	-0.12
No Rummaged	92.9	83.3			
Stole	42.9	39.3	0.11	.74	0.03
No Stole	57.1	60.7			
Tobacco smoked	3.6	6.0		1.00	-0.05
No Tobacco smoked	96.4	94.0			
Weapon from scene	3.6	7.1	0.46	.50	-0.06
No Weapon from scene	96.4	92.9			
Weapon to scene	10.7	31.0	4.48	.03	-0.20
No Weapon to scene	89.3	69.0			

As this shows, there was a higher percentage of the following behaviours exhibited when the *Ambushed* style was present, compared to when it was not; *Ordered property* and

Stole. However, there were no significant Chi-square values indicating that no associations were significant and all phi values were low, signifying low effect sizes (Cohen, 1988).The associations between the Geo-mobility style of *Ambushed* and *Sexual* offence behaviours are shown within Table 6.3.1.2b.

Table 6.3.1.2b Percentages and Chi-square output for Ambushed and Sexual behaviours

Sexual behaviours	Ambushed		Test output		
	Yes	No	χ^2	*p*	ϕ
Apologised	10.7	3.6		.16	0.14
No Apologised	89.3	96.4			
Breasts	3.6	11.9	1.65	.20	-0.12
No Breasts	96.4	88.1			
Complimented	17.9	7.1	2.72	.10	0.16
No Complimented	82.1	92.9			
Cuddled	7.1	4.8		.64	0.05
No Cuddled	92.9	95.2			
Ejaculated	46.4	28.6	3.03	.08	0.16
No Ejaculated	53.6	71.4			
Excused or justified	7.1	4.8		.64	0.05
No Excused or justified	92.9	95.2			
Fellatio	46.4	41.7	0.19	.66	0.04
No Fellatio	53.6	58.3			
Implied knowing	7.1	7.1	0.00	1.00	0.00
No Implied knowing	92.9	92.9			
Masturbated hand	10.7	2.4		.10	0.18
No Masturbated hand	89.3	97.6			
Non sexual questions	25.0	17.9	0.68	.41	0.08
No Non sexual questions	75.0	82.1			

As this shows, there were higher percentages of the following behaviours when the Geo-mobility style was *Ambushed*, compared to when it was not: *Apologised, Complimented, Cuddled, Ejaculated, Excused or justified, Fellatio, Masturbated hand, Non sexual questions,*

Penis testicles touched, Ordered redress, Ordered Sexual Activity, Penis testicles touched, Sat or laid beside victim, Self-disclosure personal, Sexual questions, Threatened physical violence, Vaginal digital and *Verbal abuse*. However, there were no instances where the *Geo-mobility style* of *Intruded* was significantly associated with individual *Sexual* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the Geo-mobility style of *Ambushed* and *Violent* offence behaviours are shown within Table 6.3.1.2c.

Table 6.3.1.2c Percentages and Chi-square output for Ambushed and Violent behaviours

Violent behaviours	Ambushed		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	25.0	17.9	0.68	.41	0.08
No Anal penile	75.0	82.1			
Bit	7.1	4.8		.64	0.05
No Bit	92.9	95.2			
Erectile dysfunction	10.7	8.3	0.15	.70	0.04
No Erectile dysfunction	89.3	91.7			
Gagged hand	10.7	17.9	0.79	.37	-0.08
No Gagged hand	89.3	82.1			
Kissed	42.9	33.3	0.83	.36	0.09
No Kissed	57.1	66.7			
Physical violence	50.0	28.6	4.30	.04	0.20
No Physical violence	50.0	71.4			
Tore clothing	14.3	8.3	0.84	.36	0.09
No Tore clothing	85.7	91.7			

Table 6.3.1.2c Percentages and Chi-square output for Ambushed and Violent behaviours (continued)

Violent behaviours	Ambushed		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no noise	39.3	42.9	0.11	.74	-0.03
No Ordered no noise	60.7	57.1			
Ordered redress	10.7	8.3	0.15	.70	0.04
No Ordered redress	89.3	91.7			
Ordered sexual act	42.9	52.4	0.76	.38	-0.08
No Ordered sexual act	57.1	47.6			
Ordered undress	14.3	19.0	0.33	.57	-0.05
No Ordered undress	85.7	81.0			
Penis testicles touched	10.7	8.3	0.15	.70	0.04
No Penis testicles touched	89.3	91.7			
Sat or laid beside victim	7.1	4.8		.64	0.05
No Sat or laid beside victim	92.9	95.2			
Self-disclosure criminal	7.1	7.1	0.00	1.00	0.00
Non Self-disclosure criminal	92.9	92.9			
Self-disclosure personal	35.7	26.2	0.93	.33	0.09
Non Self-disclosure personal	64.3	73.8			
Sexual questions	10.7	4.8	1.27	.26	0.11
No Sexual questions	89.3	95.2			
Threatened physical violence	35.7	32.1	0.12	.73	0.03
No Threatened physical violence	64.3	67.9			
Threatened weapon	17.9	21.4	0.16	.69	-0.04
No Threatened weapon	82.1	78.6			
Vaginal digital	35.7	10.7	9.32	.002	0.29
No Vaginal digital	64.3	89.3			
Verbal abuse	25.0	25.0	0.00	1.00	0.00
No Verbal abuse	75.0	75.0			
Victim arousal	17.9	10.7	0.98	.32	0.09
No Victim arousal	82.1	89.3			

As this shows, there were higher percentages of the following behaviours when the *Geo-mobility style* was *Ambushed*, compared to when it was not: *Anal penile*, *Bit*, *Erectile dysfunction*, *Kissed*, *Physical violence* and *Tore clothing.* However, there were no instances where the *Geo-mobility style* of *Ambushed* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

6.3.1.3 Abducted

The associations between the Geo-mobility style of *Abducted* and *Criminal* offence behaviours are shown within Table 6.3.1.3a.

Table 6.3.1.3a Percentages and Chi-square output for Abducted and Criminal behaviours

	Abducted		Test output		
	Yes	No	χ^2	*p*	ϕ
Blindfolded material	8.0	9.7	0.10	.76	-0.03
No Blindfolded material	92.0	90.3			
Condom	10.0	17.7	1.36	.24	-0.11
No Condom	90.0	82.3			
Disguise	8.0	3.2		.41	0.11
No Disguise	92.0	96.8			
Locked in	12.0	6.5	1.05	.31	0.10
No Locked in	88.0	93.5			
Ordered no look	12.0	9.7	0.16	.69	0.04
No Ordered no look	88.0	90.3			
Ordered no report	12.0	14.5	0.15	.70	-0.04
No Ordered no report	88.0	85.5			
Ordered property	18.0	30.6	2.36	.12	-0.15
No Ordered property	82.0	69.4			
Ordered wait escape	6.0	6.5		1.00	-0.01
No Ordered wait escape	94.0	93.5			
Rummaged	8.0	19.4	2.91	.09	-0.16
No Rummaged	92.0	80.6			

Table 6.3.1.3a Percentages and Chi-square output for Abducted and Criminal behaviours (continued)

	Abducted		Test output		
	Yes	No	χ^2	*p*	ϕ
Stole	34.0	45.2	1.44	.23	-0.11
No Stole	66.0	54.8			
Tobacco smoked	4.0	6.5		.69	-0.05
No Tobacco smoked	96.0	93.5			
Weapon from scene	6.0	6.5		1.00	-0.01
No Weapon from scene	94.0	93.5			
Weapon to scene	32.0	21.0	1.76	.19	0.13
No Weapon to Scene	68.0	79.0			

As this shows, there were higher percentages of the following behaviours when the *Geo-mobility style* was *Abducted*, compared to when it was not; *Disguise, Locked in*, *Ordered no look*, and *Weapon to the scene*. However, there were no instances where the *Geo-mobility style* of *Abducted* was significantly associated with individual *Criminal* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the *Geo-mobility style* of *Abducted* and *Sexual* offence behaviours are shown within Table 6.3.1.3b.

Table 6.3.1.3b Percentages and Chi-square output for Abducted and Sexual behaviours

	Abducted		Test output		
	Yes	No	χ^2	*p*	ϕ
Apologised	2.0	8.1		.22	-0.13
No Apologised	98.0	91.9			
Breasts	12.0	8.1	0.48	.49	0.07
No Breasts	88.0	91.9			
Complimented	8.0	11.3	0.34	.56	-0.06
No Complimented	92.0	88.7			
Cuddled	4.0	6.5		.69	-0.05
No Cuddled	96.0	93.5			
Ejaculated	32.0	33.9	0.04	.83	-0.02
No Ejaculated	68.0	66.1			
Excused or justified	4.0	6.5		.69	-0.05
No Excused or justified	96.0	93.5			
Fellatio	46.0	40.3	0.36	.55	0.06
No Fellatio	54.0	59.7			
Implied knowing	8.0	6.5		1.00	0.03
No Implied knowing	92.0	93.5			
Masturbated hand	0.0	8.1		.06	-0.19
No Masturbated hand	100.0	91.9			
Non sexual questions	18.0	21.0	0.15	.69	-0.04
No Non sexual questions	82.0	79.0			
Ordered no noise	36.0	46.8	1.32	.25	-0.11
No Ordered no noise	64.0	53.2			
Ordered redress	12.0	6.5	1.05	.31	0.10
No Ordered redress	88.0	93.5			
Ordered sexual act	54.0	46.8	0.58	.45	0.07
No Ordered sexual act	46.0	53.2			
Ordered undress	24.0	12.9	2.32	.13	0.14
No Ordered undress	76.0	87.1			

Table 6.3.1.3b Percentages and Chi-square output for Abducted and Sexual behaviours (continued)

	Abducted		Test output		
	Yes	No	χ^2	*p*	ϕ
Penis testicles touched	10.0	8.1	0.13	.72	0.03
No Penis testicles touched	90.0	91.9			
Sat or laid beside victim	4.0	6.5		.69	-0.05
No Sat or laid beside victim	96.0	93.5			
Self-disclosure criminal	6.0	8.1		.73	-0.04
Non Self-disclosure criminal	94.0	91.9			
Self-disclosure personal	20.0	35.5	3.25	.07	0.03
Non Self-disclosure personal	80.0	64.5			
Sexual questions	4.0	8.1		.46	-0.08
No Sexual questions	96.0	91.9			
Threatened physical violence	24.0	40.3	3.33	.07	-0.17
No Threatened physical violence	76.0	59.7			
Threatened weapon	22.0	19.4	0.12	.73	0.03
No Threatened weapon	78.0	80.6			
Vaginal digital	10.0	22.6	3.11	.08	-0.17
No Vaginal digital	90.0	77.4			
Verbal abuse	20.0	29.0	1.20	.27	-0.10
No Verbal abuse	80.0	71.0			
Victim arousal	6.0	17.7	3.49	.06	-0.18
No Victim arousal	94.0	82.3			

As this shows, there were higher percentages of the following behaviours when the Geo-mobility style was *Abducted*, compared to when it was not: *Breasts*, *Fellatio, Implied knowing, Ordered redress*, *Ordered sexual activity*, *Ordered undress*, and *Threatened weapon*. However, there were no instances where the *Geo-mobility style* of *Abducted* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the Geo-mobility style of *Abducted* and *Violent* offence behaviours are shown within Table 6.3.1.3c.

Table 6.3.1.3c Percentages and Chi-square output for Abducted and Violent behaviours

Violent behaviours	Abducted		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	18.0	21.0	0.15	.69	-0.04
No Anal penile	82.0	79.0			
Bit	2.0	8.1		.22	-0.13
No Bit	98.0	91.9			
Erectile dysfunction	0.0	16.1	8.86	.003	-0.28
No Erectile dysfunction	100.0	83.9			
Gagged hand	16.0	16.1	0.00	.99	0.00
No Gagged hand	84.0	83.9			
Kissed	36.0	35.5	0.00	.96	0.01
No Kissed	64.0	64.5			
Physical violence	22.0	43.5	5.73	.02	-0.23
No Physical violence	78.0	56.5			
Tore clothing	4.0	14.5	3.46	.06	-0.18
No Tore clothing	96.0	85.5			

As this shows, the only higher percentage for the *Geo-mobility style Abducted* was *Kissed*. However, there were no instances where the *Geo-mobility style* of *Abducted* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

6.3.1.4 Followed

The associations between the Geo-mobility style of *Followed* and *Criminal* offence behaviours are shown within Table 6.3.1.4a.

Table 6.3.1.4a Percentages and Chi-square output for Followed and Criminal behaviours

Criminal behaviours	Followed		Test output		
	Yes	No	χ^2	*p*	ϕ
Blindfolded material	0.0	10.3	1.70	.19	-0.12
No Blindfolded material	100.0	89.7			
Condom	20.0	13.4	0.46	.50	0.06
No Condom	80.0	86.6			
Disguise	0.0	6.2	0.98	.32	-0.09
No Disguise	100.0	93.8			
Locked in	0.0	10.3	1.70	.19	-0.12
No Locked in	100.0	89.7			
Ordered no look	0.0	12.4	2.08	.15	-0.14
No Ordered no look	100.0	87.6			
Ordered no report	6.7	14.4	0.68	.41	-0.08
No Ordered no report	93.3	85.6			
Ordered property	6.7	27.8	3.11	.08	-0.17
No Ordered property	93.3	72.2			
Ordered wait escape	0.0	7.2	1.16	.28	-0.10
No Ordered wait escape	100.0	92.8			
Rummaged	13.3	14.4	0.01	.91	-0.01
No Rummaged	86.7	85.6			
Stole	33.3	41.2	0.34	.56	-0.06
No Stole	66.7	58.8			
Tobacco smoked	0.0	6.2	0.98	.32	-0.09
No Tobacco smoked	100.0	93.8			
Weapon from scene	0.0	7.2	1.16	.28	-0.10
No Weapon from scene	100.0	92.8			
Weapon to scene	13.3	27.8	1.42	.23	-0.11
No Weapon to scene	86.7	72.2			

As this shows, there were higher percentages of the following behaviours when the *Geo-mobility* style was *Followed*, compared to when it was not; *Condom* and *Stole*. However,

there were no instances where the *Geo-mobility style* of *Followed* was significantly associated with individual *Criminal* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the Geo-mobility style of *Followed* and *Sexual* offence behaviours are shown within Table 6.3.1.4b.

Table 6.3.1.4b Percentages and Chi-square output for Followed and Sexual behaviours

Sexual behaviours	Followed		Test output		
	Yes	No	χ^2	*p*	ϕ
Apologised	0.0	6.2	0.98	.32	-0.09
No Apologised	100.0	93.8			
Breasts	0.0	11.3	1.89	.17	-0.13
No Breasts	100.0	88.7			
Complimented	6.7	10.3	0.20	.66	-0.04
No Complimented	93.3	89.7			
Cuddled	6.7	5.2	0.06	.81	0.02
No Cuddled	93.3	94.8			
Ejaculated	20.0	35.1	1.33	.25	-0.11
No Ejaculated	80.0	64.9			
Excused or justified	0.0	6.2	0.98	.32	-0.09
No Excused or justified	100.0	93.8			
Fellatio	40.0	43.3	0.06	.81	-0.02
No Fellatio	60.0	56.7			
Implied knowing	6.7	7.2	0.01	.94	-0.01
No Implied knowing	93.3	92.8			
Masturbated hand	0.0	5.2		1.00	-0.09
No Masturbated hand	100.0	94.8			
Non sexual questions	6.7	21.6	1.85	.17	-0.13
No Non sexual questions	93.3	78.4			
Ordered no noise	46.7	41.2	0.16	.69	0.04
No Ordered no noise	53.3	58.8			

Table 6.3.1.4b Percentages and Chi-square output for Followed and Sexual behaviours (continued)

Sexual behaviours	Followed		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered redress	0.0	10.3	1.70	.19	-0.12
No Ordered redress	100.0	89.7			
Ordered sexual act	40.0	51.5	0.69	.41	-0.08
No Ordered sexual act	60.0	48.5			
Ordered undress	0.0	20.6	3.77	.05	-0.18
No Ordered undress	100.0	79.4			
Penis testicles touched	0.0	10.3	1.70	.19	-0.12
No Penis testicles touched	100.0	89.7			
Sat or laid beside victim	6.7	5.2	0.06	.81	0.02
No Sat or laid beside victim	93.3	94.8			
Self-disclosure criminal	13.3	6.2	1.00	.32	0.10
Non Self-disclosure criminal	86.7	93.8			
Self-disclosure personal	46.7	25.8	2.78	.10	0.16
Non Self-disclosure personal	53.3	74.2			
Sexual questions	0.0	7.2	1.16	.28	-0.10
No Sexual questions	100.0	92.8			
Threatened physical violence	33.3	33.0	0.00	.98	0.00
No Threatened physical violence	66.7	67.0			
Threatened weapon	20.0	20.6	0.00	.96	-0.01
No Threatened weapon	80.0	79.4			
Vaginal digital	13.3	17.5	0.16	.69	-0.04
No Vaginal digital	86.7	82.5			
Verbal abuse	20.0	25.8	0.23	.63	-0.05
No Verbal abuse	80.0	74.2			
Victim arousal	0.0	14.4	2.47	.12	-0.15
No Victim arousal	100.0	85.6			

As this shows, there were higher percentages of the following behaviours when the Geo-mobility style was *Followed*, compared to when it was not: *Cuddled*, *Ordered no noise*,

Sat or laid beside, *Self-disclosure criminal* and *Self-disclosure personal*. However, there were no instances where the *Geo-mobility style* of *Followed* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

The associations between the *Geo-mobility style* of *Followed* and *Violent* offence behaviours are shown within Table 6.3.1.4c.

Table 6.3.1.4bc Percentages and Chi-square output for Followed and Violent behaviours

Violent behaviours	Followed		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	20.0	19.6	0.00	.97	0.00
No Anal penile	80.0	80.4			
Bit	6.7	5.2	0.06	.81	0.02
No Bit	93.3	94.8			
Erectile dysfunction	13.3	8.2	0.41	.52	0.06
No Erectile dysfunction	86.7	91.8			
Gagged hand	20.0	15.5	0.20	.66	0.04
No Gagged hand	80.0	84.5			
Kissed	26.7	37.1	0.62	.43	-0.07
No Kissed	73.3	62.9			
Physical violence	40.0	33.0	0.29	.59	0.05
No Physical violence	60.0	67.0			
Tore clothing	20.0	8.2	2.03	.16	0.13
No Tore clothing	80.0	91.8			

As this shows, *Anal penile*, *Bit*, *Erectile dysfunction*, *Gagged hand*, *Physical violenc*e and *Tore clothing* had higher percentages in cases where the Geo-mobility style was *Followed*, compared to when it was not. However, there were no instances where the *Geo-mobility style* of *Followed* was significantly associated with individual *Violent* behaviours. All phi values were low, signifying low effect sizes (Cohen, 1988).

In summary, there were no significant associations between the *Geo-mobility styles* and the individual behaviours.

6.3.2 Geo-mobility themes as external variables on the Smallest Space Analysis plot

Although there was only one significant association made between the *Geo-mobility* styles and *Individual offence behaviours*, there may also be broader relationships between the styles and behavioural themes. The exploration of such associations is made possible by placing the *Geo-mobility styles* as external variables on the SSA plot (shown in Chapter Five). This allows for any underlying structures to be examined. Figure 6.3.2 shows the SSA with the *Geo-mobility styles* placed as external variables on the plot.

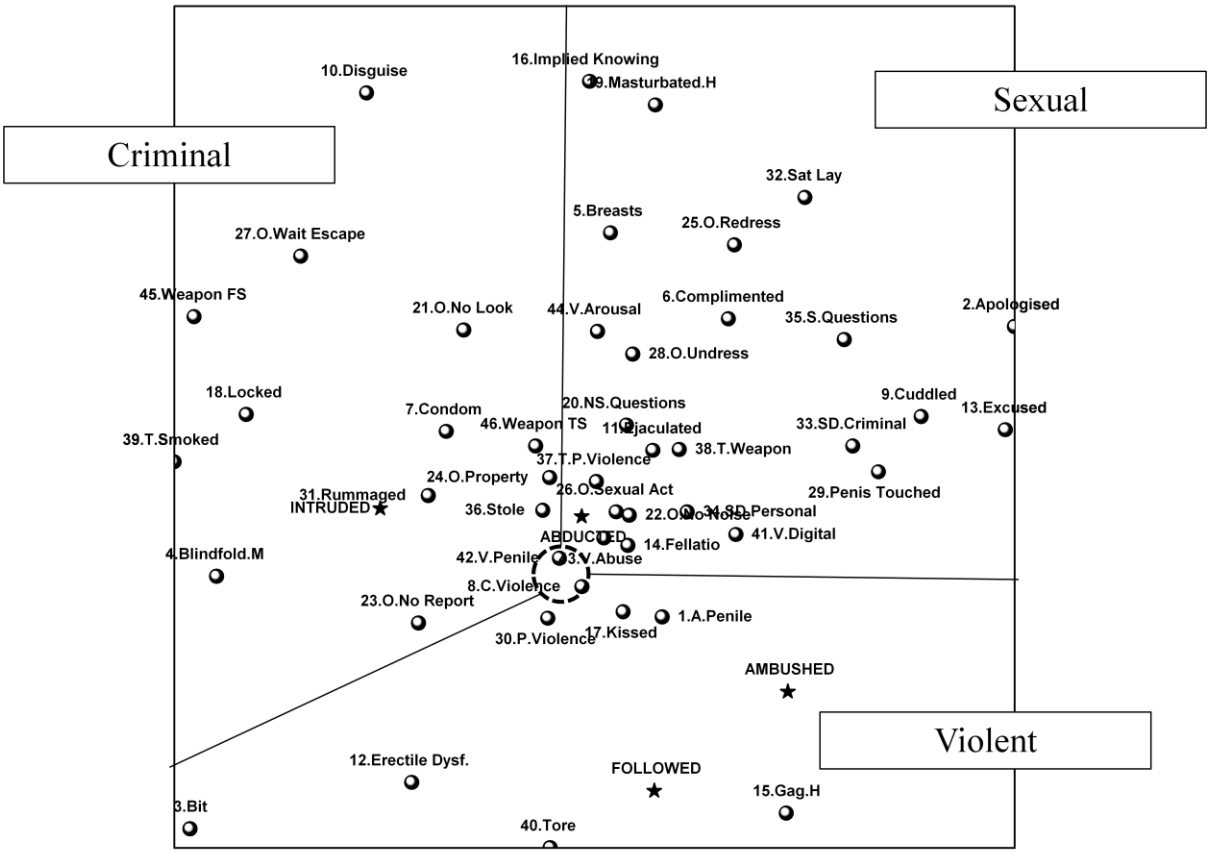


Figure 6.3.2 Smallest Space Analysis of offence behaviours with Geo-mobility styles as external variables

Key: 1x2 solution of a 2D plot; Coefficient of alienation 0.29 in 40 iterations. Percentages in brackets.

★ Intruded (17.0)	16. Implied knowing (7.1)	35. Sexual questions (6.2)
★ Ambushed (25.9)	17. Kissed (35.7)	36. Stole property (40.2)
★ Abducted (44.6)	18. Locked in (8.9)	37. Threatened physical violence (33.9)
★ Followed (12.5)	19. Masturbated hand (5.4)	38. Threatened weapon (20.5)
1. Anal penile (19.6)	20. Non sexual questions (19.6)	39. Tobacco smoked (5.4)
2. Apologised (5.4)	21. Ordered no look (10.7)	40. Tore clothing (9.8)
3. Bit (5.4)	22. Ordered no noise (42.0)	41. Vaginal digital (17.0)
4. Blindfolded material (8.9)	23. Ordered no report (13.4)	42. Vaginal penile (71.4)
5. Breasts (9.8)	24. Ordered property (25.0)	43. Verbal abuse (25.0)
6. Complimented (9.8)	25. Ordered redress (8.9)	44. Victim arousal (12.5)
7. Condom (14.3)	26. Ordered sexual activity (50.0)	45. Weapon from scene (6.2)
8. Control violence (86.6)	27. Ordered wait escape (6.2)	46. Weapon to scene (25.9)
9. Cuddled (8.0)	28. Ordered undress (17.9)	
10. Disguise (5.4)	29. Penis testicles pubic hair touched masturbated (8.9)	
11. Ejaculated (33.0)	30. Physical violence (33.9)	
12. Erectile dysfunction (8.9)	31. Rummaged (14.3)	
13. Excused or justified (5.4)	32. Sat or laid beside victim (5.4)	
14. Fellatio (42.9)	33. Self-disclosure criminal (7.1)	
15. Gagged hand (16.1)	34. Self-disclosure personal (28.6)	

6.3.3 Interpretation of the Smallest Space Analysis

As Figure 6.3.2 shows, the Geo-mobility styles lie within specific themes on the plot. The *Intruded* style formed part of the *Criminal* region, the *Abducted* style formed part of the *Sexual* region and the styles of *Followed* and *Ambushed* formed part of the *Violent* region.

6.3.3.1 Intruded and Criminal

As well as being significantly associated with individual criminal behaviours, the results of the SSA show that the *Intruded* style is related to a broader theme of criminality. Thus, the offenders who broke into the victim's house, approached, attacked, raped and released her in the same location, tended to exhibit behaviours that were could be indicative of instrumental violence and control. An example of such an offence occurred in the following example. An offender broke into a victim's house, covered her face with a dressing gown, demanded property, rummaged around in her drawers and then raped her. After the rape, he made the victim have a shower, cleaning his semen from her and then locked her inside the bathroom so he could escape.

As this is a study of rape using data from victim's statements and not using offender interviews, it is not possible to truly determine the offenders' motivations (and thus the reasons for their exhibition of criminal behaviours). It is however, possible to examine how contextual features of the offence may play a part in, influence or explain the behaviours exhibited. As mentioned in Chapter Four, Warr (1988) found that rape where the offender had intruded into the victim's house seemed to have the same 'opportunity structure' as burglary. Thus, offenders who broke into their victim's houses made the same kinds of decisions about the suitability of the target (that is, the house) as burglars had been shown to. So, for example, they assessed whether the houses provided enough cover for the offender to break into the property without being seen from the street. The findings presented here show that the offenders also exhibited behaviour similar to burglars once inside the house. Therefore, they stole items, they rummaged around for items to steal and they demanded goods from the victim.

Reflecting back on the theories that seek to explain rape behaviour, Scully and Marolla (1985) found that some offenders had raped victims as an 'added bonus.' Thus, they had been in the midst of another crime, for example a burglary, and had decided to rape the victim because the opportunity had given rise to it. With the overall *Criminal* theme relating to the *Intruded* offences, it could therefore be argued that some of the *Intruded* rapes may have been examples of this kind of behaviour. This type of crime may be an example of more

of an instrumental type of aggression (Bartol, 1986). Again, however, this would need to be investigated further. Indeed, Warr (1988) argues against the idea that 'Home-Intrusion' rapes are committed 'by accident' but that they can just occur in the same types of premises as burglary. He claims that "many of the opportunity factors that makes possible one crime enables the other as well" (Warr, 1988, p.286).

The environment within which the offences are committed may have influenced the types of behaviour exhibited. Within the *Criminal* theme, there are behaviours that are used to control the victim such as blindfolding the victim with material, locking the victim up and controlling her with a weapon from the scene. The nature of the location within which these offences are exhibited has an influence on whether these behaviours were exhibited. Thus, the kitchen would have provided the offender with knives to use to control the victim, the bed sheets within the bedroom where the victim was raped could be used to blindfold the victim and the rooms within the house may have had locks on the doors which would enable the offender to lock the victim within the rooms. It could, therefore, be argued that some of these items would not have been as available within the other *Geo-mobility* styles.

Particular characteristics of the offenders may have influenced the behaviours exhibited. The offenders within the *Criminal* theme also showed a broad knowledge of forensic awareness; for example, some offenders told the victim not to look at them, they told the victim to wait in a particular place before leaving, they brought a condom to the scene and they washed semen away from the victim's body. These kinds of behaviours may be indicative of an amount of forensic awareness (Beauregard & Bouchard, 2010); it could be argued, therefore, that offenders within these rapes may have had previous experience or knowledge of such matters. Thus, offenders intruding into the victim's house may have different characteristics than those who did not (this is further explored within the next chapter).

6.3.3.2 Ambushed and Violent

The *Ambushed* Geo-mobility style forms part of the *Violent* region on the SSA plot. Therefore, in instances where the offender approached, attacked, raped and released the victim in an indoor or outdoor semi-public location or outdoor public location, there was an overall association with a hostile, aggressive behavioural theme. In broad terms, the offender would not use verbal strategies to make conversation with the victim, would use direct physical violence and would use a limited amount of movement in order to commit the rape. An example of a 'typical' *Ambushed* rape is of the victim who was raped in public toilets.

Here, the offender approached, attack, raped and released the victim inside the toilets; he anally penetrated her, or strangled her until she was almost unconscious.

In terms of theory, and as discussed in Chapter Five, such behaviour may be indicative of underlying expressive aggression or hostility towards the victim and echoes themes suggested within theoretical (Cohen et al, 1971), clinical (Knight, 1999) and behavioural (Canter et al, 2003) models of rape motivations and behaviour. Therefore, it could be argued that those offenders who raped the victim in the same location as he approached her (in particularly secluded areas such as parks or commons) may have done so because of the high levels of aggression that they were experiencing. However, again, this cannot be fully ascertained unless interviewing the offenders.

Elements of the environment within which the *Ambushed* offences were carried out could explain the relationship between this *Geo-mobility* style and the *Violent* theme. Due to the secluded nature of the locations within which these rapes were carried out, the offender may have been able to inflict more excessive aggressive acts towards the victim than without witnesses disturbing them. Therefore, the physical violence that the offender was carrying out may have caused the victim to make a considerable amount of noise. As the location within these cases seemed to be secluded outside areas, there would be less of a chance that anyone would hear her. Equally, because of the outside nature of these offences (compared to the *Intruded* locations for example), offender may have had to be more forceful because of the threat of someone coming past. So, for example, he may have gagged the victim by putting his hand in her mouth to stop the screaming, or may have used an excessive amount of force when encountering her in order to immediately overpower her. The finding that the Ambushed rapes do relate to a broad *Violent* theme supports those of Fisher (1980) who found that offenders who had an intent to severely injure their victims did so in more isolated areas.

6.3.3.3 Followed and Violent

The *Followed* style also forms part of the *Violent* region on the SSA plot. Thus when the offender met the victim in an outdoor public place and followed her to another more secluded area (be that inside or outside), he exhibited a broad style of violence towards her. An example of such an offence is as follows. One victim noticed that an offender was following her as she was walking down a road. She continued walking to another street, and here the offender attacked her, kicking and punching her. He ripped her skirt and tights open and anally raped her. He was disturbed by the police.

As argued for the *Ambushed Geo-mobility* style, it could be that offenders within the Followed style are motivated by an expressive aggression (as described by Bartol, 1986) and that those offenders who followed their victims displayed a broad behavioural style that was indicative of hostility towards the victim or others (C/F Cohen et al., 1969). Again, however, it is difficult to establish whether this is correct without adopting alternative research methods.

Also, again, the behaviours may have been carried out as a result of the environment within which they occurred. As argued within the previous section, the *Attack* and *Crime locations* within this style may be more secluded and less likely to bear a capable guardian. Thus, the offender may have been able to behave in an excessively violent way and there would be no-one around to hear the victim. Equally, because the location was usually an outside space, the offender may have had to adopt these techniques in order to subdue the victim.

It is noted that, within the *Abducted* style, the *Attack* and *Crime location* could also be an outside space; because the *Geo-mobility* styles *Ambushed* and the *Followed* offences are both within the *Violent* SSA space, it is argued that perhaps these two styles are similar. Indeed, it could be that *Followed* offences would have been *Ambushed* offences if the offender had encountered the victim within a more 'appropriate' place. Instead, the offender had to wait for an opportunity to rape the victim within a more 'suitable' area. Again, this would have to be explored further.

6.3.3.4 Abducted and Sexual

Lastly, the *Abducted Geo-mobility* style forms part of the *Sexual* region on the SSA plot. Thus, those offenders who force their victims from one location to another location display a broad behavioural theme of pseudo-intimacy with an emphasis on the sexual acts within the themes. In example is given of the offender who abducted the victim from the street and raped her in his car. Here, he forced her to remove all her clothes, perform fellatio on him and swallow his ejaculate. He then ordered her to get dressed and released her into a different street.

This *Geo-mobility* style therefore relates to a behavioural theme that is thought to indicate pseudo-intimacy or involvement (for example, Canter et al., 2003). Thus, it could be argued that those offenders who abducted their victims may have been motivated by a need to be intimate with another person (Marshall, 1989) and/or that they are seeking sexual

gratification (for example, Cohen et al., 1969). Again, this would need to be further explored using offender interviews.

The context within which these rapes occurred may also be used to explain the offence behaviours exhibited. For example, some of the offences within the *Abducted* style included the offenders forcing the victims back to the suspect's house. These locations may be more conducive to the type of behaviour that the offender may have wanted to exhibit. Thus, he may have been able to sit or lay beside her on a bed and he may have had more time within his own house (as he knew no-one could interrupt them), that he could ask the victim questions about herself or he could disclose information about himself to her.

Also, the verbal strategies used within this region may be explained by the context within which they occurred. As stated in Chapter Five, *Threatened weapon* and *Threatened physical violence* were not expected to fall within the *Sexual* region. However, when placing these within context of the offender trying to abduct the victim, the inclusion of these variables within these regions makes more sense. The offender was trying to get the victim to move from one place to another and was therefore using threats to do so.

In summary, the *Geo-mobility* styles related to broad behavioural themes. Although, from the type of data set used within this study, only hypotheses can be generated around the potential offender motivations that might seek to explain why these relationships have occurred, the present findings do highlight the dynamic nature of these rape events. Offence behaviours could be explained by offender motivations but also by the environment within which they occurred and other contextual factors such as victim-offender interactions.

6.4 Chapter summary

This chapter examined the relationship between the *Geo-mobility styles* and the offence behaviours exhibited. This was carried out to explore how context and behaviour may be associated. The relationship between the *Geo-mobility styles* and *Individual offence behaviours* was first examined, finding that there was only one association between individual offence behaviours and the types of spatial mobility displayed within the offence. In this case, there was a significant relationship between when the offender rummaged through the victim's possessions to find items to steal and when the Intruded Geo-mobility style was used. This could show support for the assertion that such types of rapes (such as the 'Home-Intrusion' style identified within Beauregard et al., 2007b) may relate to a more instrumental reason for breaking into the victim's house. That is, the offenders who used this method wanted a monetary gain.

The general lack of association between individual offence behaviours and the particular Geo-mobility styles may be due to unreliable recording practices or situational influence as Canter (2000) argues. Thus, this chapter considered how the *Geo-mobility styles* were related to the behavioural themes established in Chapter Five.

Results showed that the *Geo-mobility style Intruded* was related to the broad Criminal behavioural theme. Thus offenders who broke into the victim's house or work and raped her there, showed behaviours that could be indicative of general criminal awareness and the need to control. Past research has found that the opportunity structure of such 'home-intrusion' style rapes is similar to that of burglary (for example, Warr, 1988) and some have acknowledged that some offenders may rape as an extension of their criminality or instrumental motivations (for example, Scully & Marolla, 1985). Contextual factors may also affect the exhibition of such behaviours as locking, blindfolding or using a weapon from the scene; the materials found within a house may allow for the offenders to act in these ways.

The *Ambushed* and *Followed* themes were both related to the *Violent* behavioural style. Thus offenders who initially approached, attacked, raped and released the victim in the same location (usually an outdoor public place) and those who followed their victims, without force, (usually from a busier location to a more secluded place), who then attacked, raped and released the victims in the same place, both exhibited broad violent behaviours. Past research has indicated that offenders who have been more intent to injure their victims, commit the offence in more isolated areas (Fisher, 1980). Theories that seek to explain violent behaviour within rapes do so by claiming that some offenders act this way in order to express particular hostility towards victims (for example, Cohen et al., 1969). Other explanations for the exhibition of these behaviours could include the idea that the offender would need to use excessive force to overpower the victim in these cases. As the location of these offences was usually in an outdoor public place, the chance that someone would hear the victim would be increased. Thus, the offender may have needed to subjugate her quickly.

Finally, the *Abducted* style was related to the *Sexual* behavioural theme. Thus, those who forcibly took the victim from one location to another, exhibited behaviours that may indicate the need for intimacy (Marshall, 1989) or for the satisfaction of sexual urges (for example, Cohen et al., 1969). Contextual influences on offence behaviour could also explain this relationship; being within the suspect's house would allow him to have more time and more privacy to behave in an "intimate" way towards the victim or to carry out particular sexual activities. Equally, verbal threat strategies may have been used in order to force the victim from one place to another.

This chapter highlights the differences between the *Geo-mobility styles* in terms of the broad offence behaviours exhibited, even though there were few significant associations between the specific offence behaviours and the styles. It is important to highlight that the findings do not suggest that all *Intruded* rapes are *Criminal* and so on. Instead, it suggests that there are different gradations of offence styles within the samples and that there are important distinctions between broad themes. It also underlines the importance of examining behaviour within context and the influence environmental, offender or victim factors may have on this. This further underlines the findings from Beauregard et al., (2007b) who showed how dynamic an event the rape situation is. Without examining the offence behaviours in context, the researcher may be artificially removing important, mediating factors that affect the exhibition of these factors. In turn, ignoring these factors may therefore explain the particular lack of support for assumptions such as consistency, inter-offender individuation or homology. Thus, this highlights the importance of considering context before deciding which behaviours may or may not be useful for the tasks of offender profiling and case linkage.

The limitations of this chapter include those already discussed. Therefore, there are difficulties with using accounts from detected cases and ones that have been interpreted by both a police officer and then a researcher. Another limitation of this chapter is that the explanations for why the *Geo-mobility styles* and the behavioural themes may be related are, at this stage, are hypotheses. Thus, it is difficult to ascertain why and how the environmental, offender and victim factors may influence each other without interviewing the victim and the offender. This is a strength that is found within the Beauregard et al., (2007a) studies. However, this chapter sets the framework for future studies which may push forward current thinking. The method of Smallest Space Analysis is not only used to provide empirical evidence for existing theory (how it is used in studies such as Canter & Heritage, 1990) but can also be used to generate hypotheses that can be used for future research.

In summary, the present chapter has shown that the rape event is a fluid, dynamic one and that offence behaviour can be examined and hypotheses can be formed about how and why these factors may influence each other. Such information can be used to inform theory. However, it is also useful to try to understand how useful knowledge of contextual factors can be at pragmatic tasks. Therefore, the next two chapters examine whether the *Geo-mobility* styles are useful in the methods of offender profiling and case linkage.

CHAPTER SEVEN
OFFENDER PROFILING

This chapter examines how the 131 offenders' spatial and offence behaviour relates to their background characteristics, as well as measuring how accurate these aspects are at predicting these characteristics. Previous research into offender profiling has explored how and if actions and characteristics can be related, examining both multivariate and bivariate relationships between the two (for example, Goodwill, Alison, & Beech, 2009; Mokros & Alison, 2002). These studies have often focused upon behavioural aspects of the offence or the relationship between journey to crime and aspects of the offence, whilst little research has been carried out in regards to how spatial behaviour *within* the offence can be related to offender characteristics. The present chapter examines whether spatial (the *Geo-mobility styles*, *Location type, Transportation type*) and behavioural aspects (*individual behaviours*) are related to offender background characteristics (*age, ethnicity, distance travelled to offence, type of previous offence, previous spatial behaviour*). If associations were found, the ability of the offence behaviour (be it spatial or behavioural) to predict the particular offender background characteristic was measured using logistic regression and Receiver Operating Characteristics (ROC). The 131 offenders identified as having committed the 112 offences were the sample used within this chapter. Results showed that the *Geo-mobility styles* were not significantly related to the *Offender characteristics*. Moreover, there were only three significant associations between *Individual offence behaviours* and *Offender background characteristics*. When the offence behaviours were assessed to establish whether they could be accurately used to predict offender characteristics, it was found that they could not. Results are discussed in terms of the influence of situational factors on offence behaviour, the existence of homology and the implications for suspect prioritisation.

7.1 Introduction

7.1.1 Consistency, inter-offender variation and homology

As Chapter One outlines, 'offender profiling' is based on two main assumptions (Alison et al., 2002). Firstly, there must be consistency in the way in which offenders behave in both their non-criminal and criminal life (Offender consistency hypothesis; Canter, 1995) and that they must exhibit a level of behavioural consistency over their offending in general (Green et al., 1976). This consistency must also differ, in some way, from other offenders committing similar offences (Inter-offender variation or differentiation, Canter, 2000;

Goodwill & Alison, 2007). Secondly, offenders who commit crimes in a similar manner (be that the same kind of crime, thematic or specific behaviours) must share the same kind of background characteristics (the Homology assumption, Alison et al., 2002). Findings in support for behavioural consistency and inter-offender variation has been promising; researchers have often found that offenders' spatial behaviour and other MO behaviours have been exhibited, at some level of consistency, across a series of offences (examples from rape research include Grubin et al., 2001 and Santtila, et al., 2005). Results from studies examining homology, however, have been less encouraging, with researchers such as Mokros and Alison (2002) finding no associations between offence behaviours and offender characteristics and others finding limited support for the homology assumption (for example, Doan & Snook, 2008). Other researchers have also called for a more detailed examination of the specific individual behaviours that may be particularly useful in determining offender characteristics (Goodwill et al., 2009).

7.1.2 'Useful' behaviours

A large body of research exists that suggests that aspects of the offenders' spatial behaviour can be associated with offender background characteristics (see chapter One for a discussion). In summary, most of this research has focused on establishing the relationship between the offender's 'journey to crime' and their demographic details. For example, age seems to be an important factor in influencing distance 'travelled' from a base, with other offenders seeming to travel further afield than their younger counter-parts (for example, Baldwin & Bottoms, 1976; Gabor & Gottheil, 1984; Canter & Gregory, 1994; Rhodes & Conly, 1991; Davies & Dale, 1995). Criminal history or experience may also be mediating factors, with offenders with a previous conviction travelling further than those without (Baldwin & Bottoms, 1976; Gabor & Gottheil, 1984; Rhodes & Conly, 1991). A limitation in such research is that, within an investigation of a stranger rape, the police or crime analysis will not know the offenders' journey to crime distances and therefore, inferences about their background characteristics from such information will not be possible. Essentially, this aspect of the offenders' spatial behaviour is an offender characteristic.

Therefore, other research in the spatial domain has centred on establishing links between aspects of the spatial behaviour within the offence itself, rather than to the offence. For example, the relationship between crime location choice and journey to crime has been examined, with researchers finding that offences carried out in more urban environments suggest that the offender has not travelled as far as an offender would do if the offence was

carried out in a rural environment (Warren et al., 1998). Similarly, distance travelled has been found to be associated with the type of location chosen; LeBeau (1987a) found that offenders who broke into rape victim's houses travelled shorter distances than those who did not, whilst Canter and Gregory (1994) found that rapists travelled further when they met their victim outside.

Offenders' spatial behaviour has also been found to be consistent over a series of crimes and to provide accuracy in the prediction of linkage (please see Chapter One for a discussion of this). In summary, inter-crime proximity (the 'nearness' of distances between offences) has been found to be more accurate at predicting case linkage than other offence behaviours (for example, Bennell & Canter, 2002; Bennell & Jones, 2005).

Within studies examining possible associations with other offence behaviours and offender characteristics, within general 'Offender profiling' rape research, there have been findings that highlight particularly 'useful' behaviours or themes. Firstly, studies have shown that particularly stealing and theft behaviours are indicative of past property convictions. Häkkänen et al., (2004), for example, found that the behavioural theme of 'Theft' found within their sample of stranger rapes, could be significantly associated with a characteristic theme of 'Criminal/Property.' Thus, offences which included offenders who were displaying broad theft-like behaviours such as stealing and rummaging for items to steal could be related to offenders who had theft and drink-driving in their offence background. Secondly, Davies et al., (1997) found an association between forensic awareness and previous convictions, notably wearing gloves or otherwise protecting themselves against finger print evidence, and a previous burglary conviction. Also, the researchers found a relationship between the offender destroying semen and a previous sex offence. Thirdly, a link has been made between the use of a weapon and previous convictions for weapon and/or drug use (Goodwill et al., 2009). Fourth, researchers have often found a link between violent behaviour displayed within an offence and previous convictions for or experience of aggression. Warren et al., (1991) found that particularly violent rape offences could be indicative of offenders who behaved in an increasingly violent manner within past sexual offences. Goodwill et al., (2009) found the violent behaviour (as described in models such as Canter et al., 2003) of tearing the victim's clothes or using a weapon, to be associated with a pre-conviction for violence. Lastly, particular sexual behaviours exhibited may also suggest a previous sex offence; Goodwill et al., (2009) found that anal penetration was associated with a sexual pre-conviction.

7.1.3 Explanations of 'usefulness'

There are several explanations around why particular offence behaviour is useful for the prediction of offender characteristics (be this due to behavioural consistency, inter-offender variation or the homology assumption). As Markson et al., (2010) suggest, theories from environmental criminology may help us to understand why offenders' spatial behaviour has been found to be consistent across a series of offences. Crime Pattern Theory (Brantingham & Brantingham, 1981, as discussed in Chapter One), for example, posits that offenders have a particular 'awareness space' of the world around them (C/F 'mental maps', Canter & Hodge, 2000) within which they carry out their criminal and non-criminal activities. Offenders are likely, therefore, to offend within areas which appear within this awareness space, in areas they know. Other spatial research offers examples of why offenders will repeatedly use areas that they are familiar with; some authors have examined the notion of 'domocentricity', which explains how offenders will use their base (usually their home) as a focal point within their awareness space, from which they will travel to offend (for example, Canter & Gregory, 1994). Distance to crime research has supported the premise that offenders consistently, do not travel far to commit offences (for example, Canter & Larkin, 1993; Lebeau, 1987a) and that this might be due to the familiarity of the area within which they live, work or socialise (C/F Routine Activity Theory, Cohen & Felson, 1979) and/or because this requires the least effort (C/F the Principle of least effort, Zipf, 1949).

The influence of situation on the exhibition of particular offence behaviours has been widely noted. As discussed in Chapter One, researchers of personality have noted the importance of the situation on whether people behave in a particular manner; this is the notion that there are possible ""if…then" relations between clusters of behaviours and clusters of situations" (Mischel, 1990; Wright & Mischel, 1987a, cited in Alison et al., 2002, p.16). Mischel (1990) and Mischel & Wright (1987a) emphasise that actions ('thens') can depend on a whole range of different scenerios (of 'ifs'). It is thought that factors such as victim resistance (Ullman, 2007) can lead to changes in intended behavioural strategies. As Bennell and Canter (2002) suggest, this may be why aspects of the offender's spatial behaviour may be more consistent; as this behaviour is one that is, at some level, pre-determined, before the crime event, and thus then it is less likely to be dependent on situational factors.

7.1.4 Rationale and research questions

In general, there has been a shift in thinking over the past few years. Since the acknowledgement that homology cannot always be assumed, and that offender actions are sensitive to situational variations, researchers have started to examine the influence that geographical variables may have on offence behaviour. In particular, there have been models derived that examine the spatial mobility within offences, relating how geographical and behavioural variables interact. Beauregard et al (2007b), for example, gives a dynamic account of the rape event, showing the number and types of locations involved in serial rape, alongside the rapists' hunting and approach methods (see Chapter Four for a full description of this model). As such, there has been no examination of how and if this dynamic event may be associated with offender background characteristics. Are there particular locations and, therefore, subsequent behaviours that are particularly useful for predicting offender characteristics? Is this way of examining the interaction between the offenders' spatial and offence behaviour more or less useful than other aspects of the offence?

Recent research has also highlighted the need to examine which individual offence behaviours may be useful in predicting offender background characteristics. Goodwill et al., (2009) called for a more systematic approach to offender profiling research and emphasised the importance only using reliable features of offences within information systems such as ViCLAS).

The present chapter will extend the work of Beauregard et al. (2007b) to examine whether the spatial behaviour shown within the offences (therefore, the Geo-mobility styles) can be related to offender background characteristics. This is carried out to meet the need for more dynamic models of rape behaviour which examine how context can influence the exhibition of offence behaviour (Alison et al, 2010) and that consider how important situational impact is on the homology assumption (Mokros & Alison, 2002). This chapter will also examine how the Geo-mobility styles compare against other more 'static' offence aspects such as other spatial elements (for example, location type) and individual behaviours. This answers the call from Goodwill et al., (2009) for a better understanding of exactly which offence behaviours will be more accurate than others at predicting offender characteristics. In summary, therefore, this chapter aimed to:

- Examine if the Geo-mobility styles can be associated with offender background characteristics

- Compare the predictive accuracy of a range of aspects of the offence (spatial and offence behaviours) at predicting offender characteristics.

7.2 Method

7.2.1 Sample

For this chapter, the sample consisted of the 131 offenders who committed the 112 stranger rape offences. The offender background characteristics for each of the 131 offenders was considered at each separate offence committed (although as discussed in Chapter Three, there are 124 unique offenders within the sample). Each of these 131 offenders' characteristics was compared against the *Spatial* and *Individual offence behaviours* derived from the 112 victim statements. These were extracted from the Metropolitan Police Service's Crime Recording Information System (CRIS), committed between May 2004 and December 2006 and against 114 victims.

The 131 offenders had been arrested for the 112 stranger rapes; for 13 offences, there was more than one offender; in eight cases, there were two offenders; in four cases, there were three offenders; in one case, there were five offenders. The mean age of the offenders, at the time of the offence, was 24.7 years (*SD* = 8.19), median age was 23 years, with a range from 14 to 68 years old. In terms of ethnicity, 58.8% were classified as Afro-Caribbean, 19.1% as White, 12.2% were termed Dark European and 6.1% as Asian. In terms of distances travelled to the *Initial approach location*, 113 distances could be measured; the mean distance travelled was 4.54 km (*SD* = 5.77 km), whilst the median Distance travelled to Initial approach location was 2.02 km (range from 0 km to 31.04 km). In terms of the distances travelled to the *Crime location*, 115 distances could be measured; the mean distance travelled was 4.13 km (*SD* = 5.71 km), whilst the median distance travelled to the *Crime location* was 1.61 km (range from 0 km to 31.04 km).

Out of all the offenders, 84.0% (*n* = 120) had a previous offence recorded on CRIS; the mean number of offences recorded for the offenders was 7.62 (*SD* = 13.25), with a median of three, ranging from no crimes to 96. The most frequent type of offence to have within their background was a *Violent offence* (58.0%, *n* = 76), then a *Theft offence* (42.7%, *n* = 56), a *Drugs offence* (31.3%, *n* = 41), a *Robbery offence* (31.3%, *n* = 41), a *Sexual offence* (28.2%, *n* = 37), a *Burglary offence* (27.5%, *n* = 36), a *Criminal damage offence* (22.1%, *n* = 29), a *Fraud offence* (6.9%, *n* = 9), and a *Motoring offence* (3.1%, *n* = 4). In terms of the offenders' previous spatial behaviour, the *Distance travelled to previous offences* could be calculated for 86 offenders; the mean *Distance travelled to previous offences* was 3.17 km

(*SD* = 3.79 km), whilst the median distance was 2.43 km (range from 0 km to 31.57 km). The distance between previous offences was measured using the *Mean inter-point distance* between all the offenders' previous offences and could be calculated for 89 offenders. Here, the mean of this measurement was 4.40 km (*SD* = 3.91 km), whilst the median *Mean-inter point distance* was 3.51 km (range from 0 km to 27.20 km).

In this chapter, for offences that had been carried out by multiple offenders, average measurements were used when considering distance travelled from home base and offender age (these were non-normally distributed and, therefore, the median measurement was used). For ethnicity, all offences with multiple offenders were within the same ethnic group and therefore, this was used. For those offenders who had committed more than one offence within the sample, each offender's characteristics were considered at the time of the offence and, in essence, were treated as a 'different' offender. This was because some of the offenders' characteristics may have changed in between offences (for example, age and arrest history) and because, the police, when confronted with investigating a stranger rape, would not necessarily know that they were dealing with a serial offender.

7.2.2 Procedure

7.2.2.1 Spatial and Offence behaviours

The victim statements for the 112 offences were examined and the Spatial and Offence behaviours were extracted. This process is explained within Chapters Four and Five respectively. Therefore the *Spatial* and *Individual offence behaviours* variables used within this chapter are outlined in Appendices Seven and Nine respectively and are as follows: *Geo-mobility style* (*Intruded*, *Ambushed*, *Abducted* and *Followed*); *Location type* (*Indoor private*, *Indoor semi-public*, *Indoor public*, *Outdoor private*, *Outdoor semi-public*, *Outdoor Public*, *Private transport*, *Public transport*); *Transportation* (*Foot only*); *Individual offence behaviours.*

For the purpose of this chapter, some of the variables were recoded. *Geo-mobility style* was considered as one variable with four levels (*Intruded* = '1', *Ambushed* = '2', *Abducted* = '3', *Followed* = '4'); each *Location type* was considered as either *Indoors* ('1') or *Outdoors* ('0') (including in or on transport); *Transportation* was 'collapsed' and recoded as either '*Foot only'* ('1') or *No Foot only* ('0'); the coding of the *Individual offence behaviours* was the same ('1' if the behaviour was present, '0' if the behaviour was absent). This recoding was carried out to reduce the number of 2 x 2 contingency tables to be used within the Chi-square analysis and to minimise the likelihood that the expected cell frequency be

less than five in at least 25% of the cells). The *Spatial* and *Offence behaviours* are regarded as the independent variables within this chapter.

7.2.2.2 Offender characteristics

The *Offender characteristics* used within this chapter are to be regarded as the dependent variables. These were as follows: *Age*, *Ethnicity*, *Distance travelled to Initial approach location*, *Distance travelled to Crime location*, *Type of previous offence* (*Burglary, Criminal damage, Drugs, Fraud, Motoring, Robbery, Sexual, Theft* and *Violence*), *Distance travelled to previous offences*, and *Mean inter-point distances of previous offences*.

The way in which these variables were derived from the data is described in Chapters Three and descriptions are given in Appendix Six.

The Distance 'travelled' to the *Initial approach location* and to the *Crime location* from the offender's home base was measured by calculating the Euclidean ("crow flies") distance between these addresses. Each address can be 'geo-coded' (given an X and Y coordinate) and the distance between these two co-ordinates can be calculated using Pythagoras' theorem (please see Chapter Two for more details).

For the first part of the analysis within this chapter (that is, examining whether there was an association between the *Spatial* and *Individual offence behaviours* and the *Offender characteristics*), the level of measurement for these variables was as follows: *Age* was measured in years, *Ethnicity* was recoded and dichotomised to be '*White* = 1' and *No White* = '0'), *Distance travelled to Initial approach location* was continuous and measured in kilometres, *Distance travelled to Crime location* continuous and was measured in kilometres, each *Type of previous offence* was coded as the offender having this type of offence in his background '1' or not having this type of offence in his background '0'; *Distance travelled to previous offences* and *Mean inter-point distances of previous offences* was measured in kilometres. The reason for the dichotomisation of *Ethnicity* was to reduce the likelihood of violating assumptions of the Chi-Square test; *Types of offences* were dichotomised to control for prolific offenders (as discussed in Chapter Three).

For the second part of the analysis within this chapter (that is, to examine whether the Spatial and *Individual offence behaviours* could be accurate predictors of *Offender background characteristics*), further dichotomisation of the dependent variables was needed. This was to enable the offender characteristics to be compared alongside each other in the subsequent logistic regression and ROC analysis.

Therefore, the variables were recoded as follows; *Age* was recoded as *Age more than*

median (offenders were scored with a '0' if they were aged 23 or more, and with a '1' if they were aged under 23); *Distance travelled to Initial approach location* was recoded as *Distance to Initial approach location more than median* (offenders who had travelled more than 2.02 km to the *Initial approach location* were scored as '1', offenders who had travelled 2.02 km or less were scored with a '0'); *Distance travelled to Crime location* was recoded as *Distance travelled to Crime location more than median* (offenders who had travelled more than 1.61 km were scored as '1', whilst offenders who had travelled shorter distances than this were scored as '0'); *Distance travelled to previous offences* was recoded as *Distance travelled to previous offences more than median* (offenders who had travelled more than 2.43 km in previous offences were scored with a '1', whilst offenders who had travelled shorter distances were scored with a '0'); *Mean inter-point distances of previous offences* was recoded as *Mean inter-point distances more than mean* (offenders who had a *Mean inter-point distance* for previous offences of less than 4.40 km were recoded as '1', whilst offenders who had a lower mean, *Mean inter-point distance* scored '0.'). Median scores were used for *Age*, *Distance travelled to Initial approach location*, *Distance travelled to Crime location* and *Distance travelled to previous offences* as the distribution of these measurements were found to differ significantly from a normal distribution, calculated using the Kolmogorov–Smirnov test (*Age*; $Z = 1.59$, $p < .05$; *Distance travelled to Initial approach location*; $Z = 2.29$, $p < .001$; *Distance travelled to Crime location*; $Z = 2.55$, $p < .001$; *Distance travelled to previous offences*; $Z = 1.87$, $p < .001$). The mean distance was used for *Mean inter-point distance* as this did not differ significantly from a normal distribution ($Z = 1.23$, $p = .10$).

7.2.3 Analysis

7.2.3.1 Examining the relationship between offence behaviour and offender characteristics

The first part of the analysis within this chapter was to establish whether there was an association or significant differences between the *Spatial* and *Individual offence behaviour* exhibited within the 112 offences in terms of the background characteristics of the offenders. For this reason therefore, the *Spatial* and *Individual offence behaviours* were the *independent variables*, whilst the *Offender background characteristics* were the *dependent variables*. The following analysis was used.

7.2.3.2 Chi-square analysis

To examine the associations between categorical independent and dependent variables, Chi-square analysis was used (Pallant, 2007) [24]. Table 7.2.3.2 shows the various Chi-square analyses carried out.

[24] Some of the 2 x 2 contingency tables violated the Chi-Square assumption that the frequency of the expected cells should be at least 10 and Fishers Exact test was conducted as an alternative (Pallant, 2007).

Table 7.2.3.2 Chi-square tests carried out on the categorical dependent variables

Independent variable	Dependent variable	Type of contingency table
Geo-mobility style	Ethnicity	4 x 2
	Burglary offence	4 x 2
	Criminal damage offence	4 x 2
	Drugs offence	4 x 2
	Fraud offence	4 x 2
	Motoring offence	4 x 2
	Robbery offence	4 x 2
	Sexual offence	4 x 2
	Theft offence	4 x 2
	Violent offence	4 x 2
Initial approach location type	Ethnicity	2 x 2
	Burglary offence	2 x 2
	Criminal damage offence	2 x 2
	Drugs offence	2 x 2
	Fraud offence	2 x 2
	Motoring offence	2 x 2
	Robbery offence	2 x 2
	Sexual offence	2 x 2
	Theft offence	2 x 2
	Violent offence	2 x 2
Attack location type	Ethnicity	2 x 2
	Burglary offence	2 x 2
	Criminal damage offence	2 x 2
	Drugs offence	2 x 2
	Fraud offence	2 x 2
	Motoring offence	2 x 2
	Robbery offence	2 x 2
	Sexual offence	2 x 2
	Theft offence	2 x 2
	Violent offence	2 x 2
Crime location type	Ethnicity	2 x 2
	Burglary offence	2 x 2
	Criminal damage offence	2 x 2
	Drugs offence	2 x 2
	Fraud offence	2 x 2
	Motoring offence	2 x 2
	Robbery offence	2 x 2
	Sexual offence	2 x 2
	Theft offence	2 x 2
	Violent offence	2 x 2
Victim release location type	Ethnicity	2 x 2
	Burglary offence	2 x 2
	Criminal damage offence	2 x 2
	Drugs offence	2 x 2
	Fraud offence	2 x 2
	Motoring offence	2 x 2
	Robbery offence	2 x 2
	Sexual offence	2 x 2
	Theft offence	2 x 2
	Violent offence	2 x 2

Table 7.2.3.2 Chi-square tests carried out on the categorical dependent variables (continued)

Independent variable	Dependent variable	Type of contingency table
Transportation type	Ethnicity	2 x 2
	Burglary offence	2 x 2
	Criminal damage offence	2 x 2
	Drugs offence	2 x 2
	Fraud offence	2 x 2
	Motoring offence	2 x 2
	Robbery offence	2 x 2
	Sexual offence	2 x 2
	Theft offence	2 x 2
	Violent offence	2 x 2
Individual offence behaviours	Ethnicity	46 times 2 x 2
	Burglary offence	46 times 2 x 2
	Criminal damage offence	46 times 2 x 2
	Drugs offence	46 times 2 x 2
	Fraud offence	46 times 2 x 2
	Motoring offence	46 times 2 x 2
	Robbery offence	46 times 2 x 2
	Sexual offence	46 times 2 x 2
	Theft offence	46 times 2 x 2
	Violent offence	46 times 2 x 2

7.2.3.3 Parametric and non-parametric analysis

In order to examine whether the *Spatial* and *Individual offence behaviours* differed in terms of the *Offender Characteristics* which were measured on a continuous scale, appropriate inferential tests were used. As stated previously, the only continuously measured *Offender characteristic* variable that was normally distributed was *Mean-inter point distance*. Therefore, the median scores for the other variables were considered, alongside the appropriate non-parametric tests. For *Mean inter-point distance*, mean distances and appropriate parametric tests were used. Table 7.2.2.1.3 shows the inferential tests carried out for the continuous dependent variables.

Table 7.2.3.3 Inferential tests carried out on the continuous dependent variables

Independent variable	Dependent variable	Type of inferential test
Geo-mobility style	Age	Kruskal Wallis
	Distance to Initial approach location	Kruskal Wallis
	Distance to Crime location	Kruskal Wallis
	Distance to previous offences	Kruskal Wallis
	Mean inter-point distance for previous offences	One way ANOVA
Initial approach location type	Age	Mann Whitney U
	Distance to Initial approach location	Mann Whitney U
	Distance to Crime location	Mann Whitney U
	Distance to previous offences	Mann Whitney U
	Mean inter-point distance for previous offences	One way ANOVA
Attack location type	Age	Mann Whitney U
	Distance to Initial approach location	Mann Whitney U
	Distance to Crime location	Mann Whitney U
	Distance to previous offences	Mann Whitney U
	Mean inter-point distance for previous offences	One way ANOVA
Crime location type	Age	Mann Whitney U
	Distance to Initial approach location	Mann Whitney U
	Distance to Crime location	Mann Whitney U
	Distance to previous offences	Mann Whitney U
	Mean inter-point distance for previous offences	One way ANOVA
Victim release location type	Age	Mann Whitney U
	Distance to Initial approach location	Mann Whitney U
	Distance to Crime location	Mann Whitney U
	Distance to previous offences	Mann Whitney U
	Mean inter-point distance for previous offences	One way ANOVA
Transportation type	Age	Mann Whitney U
	Distance to Initial approach location	Mann Whitney U
	Distance to Crime location	Mann Whitney U
	Distance to previous offences	Mann Whitney U
	Mean inter-point distance for previous offences	Independent T-test
Individual offence behaviours	Age	46 x Mann Whitney U
	Distance to Initial approach location	46 x Mann Whitney U
	Distance to Crime location	46 x Mann Whitney U
	Distance to previous offences	46 x Mann Whitney U
	Mean inter-point distance for previous offences	46 x Independent T-test

7.2.3.4 Bonferroni corrections

Due to the high number of tests that will be carried out on each dependent variable (n = 52), this increases the chance of making a Type 1 error (that is, finding an association or a significant difference from the tests when there is not one) (Howell, 2002; Pallant, 2007). To correct for this, the error rate can be divided by the number of tests to be carried out on the dependent variable (Pallant, 2007). For this reason, therefore, the adjusted alpha is 0.0009.

7.2.3.5 Assessing the ability of the spatial and behavioural variables at predicting offender characteristics

7.2.3.5.1 Logistic regressions

Any significant associations were further assessed within bivariate logistic regressions (enter method) to examine if the aspects of the offences were accurate at predicting each offender characteristic. These models provided a measure of assessing how accurate the independent variables (the behaviours) were predicted the dependent variables (the background characteristics). (See Chapter Two for more details).

7.2.3.5.2 Receiver Operating Characteristics (ROC) analysis

Any models that provided a significant fit to the data were compared with each other within ROC analysis. So, for example, if two aspects of the offence were, separately, found to be accurate predictors of particular *Offender characteristics*, both would be used in the ROC analysis to measure comparative predictive accuracy. This is a method used recently by Goodwill et al., 2009). (Again for more information on this method, please see Chapter Two).

7.3 Results

7.3.1 Examining the associations between spatial and offence behaviours with offender characteristics

Analysis examining the possible relationships between the *Spatial* and *Individual offence behaviours* with the *Offender characteristics* is discussed within this section. Due to the high number of tests, tables summarising the cross-tabulations, descriptive statistics and results of inferential tests are presented in Appendices 11-86. Summaries of results will presented here.

7.3.1.1Age

7.3.1.1.1 Age and Geo-mobility styles

Appendix 11 shows the descriptive and inferential statistics for *Age* in each of the *Geo-mobility styles*. The highest median age shown within the *Geo-mobility styles* was for *Intruded* (*Mdn* = 30, range 16-44). *Followed* had the next highest median age at 23 (range 14-47) and then *Ambushed* and *Abducted* which both had a median age of 22 (ranges 15-37 and 15-48 respectively). A Kruskal Wallis test was conducted to examine whether these differences were significant, which they were not ($\chi^2 = (3) = 7.72$, $p = .05$). The effect size of Kruskal Wallis tests would usually be carried out if the result was significant and after post-hoc Mann Whitney U tests had been undertaken between the various categories to see where the differences lay (Newcombe, 2005). As this result was not significant, the effect size was not calculated.

7.3.1.1.2 Age and Location type

Appendices 12-15 show the descriptive and inferential statistics for *Age* for each of the *Location types*. When examining the differences in age between the types of *Initial approach location*, it was found that those approaching victims in an indoor location had a slightly higher median age of 24, as opposed to 22. However, a Mann Whitney U test showed that this difference was not significant ($Z = -2.25$, $p = .03$). The effect size was calculated using the formula $r = Z/\sqrt{N}$, and showed a small effect size ($r = -0.20$).

For the type of *Attack location*, those attacking the victim inside also had higher median ages than those who did not (27 years old as opposed to 22). A Mann Whitney U test showed that this difference was not significant ($Z = -2.80$, $p = .01$). This showed a small effect size ($r = -0.20$).

Again for the *Crime location*, those committing the offence inside were slightly older than those who did not (24 years as opposed to 22 years old). However, a Mann Whitney U test did not show this difference as significant ($Z = -1.93$, $p = .05$), with a small effect size ($r = -0.17$).

Lastly, those who released their victim inside had a median age of 24, whilst those who did not had a median age of 22. Again, a Mann Whitney U test did not show this difference as significant ($Z = -1.41$, $p = .16$), with a small effect size ($r = -0.12$).

7.3.1.1.3 Age and Transportation types

Appendix 16 shows the descriptive and inferential statistics for *Age* and *Transportation* type. Those offenders who did not travel only on foot had a higher median age than those who did (26.5 years compared with 23 years). However, a Mann Whitney U test did not show this difference as significant (Z = -1.44, p = .15), with a small effect size (r = -0.13).

7.3.1.1.4 Age and Individual offence behaviours

Appendix 17 shows the median ages of the offenders for *Individual offence behaviours* and output for Mann Whitney U tests. When the behaviour *Condom* was present, the median age of offenders was 18, significantly younger than those who did not exhibit this behaviour who had a median age of 24 (Z = -3.36, p < .001). This yielded a small effect size of -0.29. Also, if the offender exhibited the verbal behaviour *Self disclosure criminal*, their median age was 17 years, as opposed to 24. A Mann Whitney U test showed that this difference was also significant (Z = -3.55, p < .0001), with a small effect size of -0.31.

7.3.1.2 Ethnicity

7.3.1.2.1 Ethnicity and Geo-mobility styles

As Appendix 18 shows, within the *Geo-mobility styles*, the highest percentage of offenders who were *White* in ethnicity fell into the *Ambushed style* (40%, n = 10). However, a 2 x 4 cross-tabulation and Chi-Square analysis showed that any associations between *Ethnicity* and *Geo-mobility styles* were not significant (χ^2 = (3) = 5.35, p = .15). The phi coefficient was used as a measure of effect size and this showed a small effect (ϕ = 0.20).

7.3.1.2.2 Ethnicity and Location type

As Appendix 19 shows, 16.0% of White offenders (n = 4) approached the victim in an indoor location, compared with 23.6% (n = 25) who were not White. A 2 x 4 cross-tabulation and Chi-Square analysis showed that any associations between *White* and *Initial approach location* type were not significant (χ^2 = (3) = 0.68, p = .41). The phi coefficient was used as a measure of effect size and this showed a small effect (ϕ = 0.07).

This also shows that 20% of White offenders (n = 5) attacked the victim in an indoor location, compared with 25.5% (n = 27) who were not White. A 2 x 4 cross-tabulation and Chi-Square analysis showed that any associations between *Ethnicity* and *Attack location* type

were not significant ($\chi^2 = (3) = 0.33$, $p = .57$). The phi coefficient was used as a measure of effect size and this showed a small effect ($\phi = 0.05$).

This also shows that 28% of White offenders ($n = 7$) raped the victim in an indoor location, compared with 38.7% ($n = 41$) who were not White. A 2 x 4 cross-tabulation and Chi-Square analysis showed that any associations between *Ethnicity* and *Crime location* type were not significant ($\chi^2 = (3) = 0.99$, $p = .32$). The phi coefficient was used as a measure of effect size and this showed a small effect ($\phi = 0.09$).

Lastly, 32.0% of White offenders ($n = 8$) released the victim in an indoor location, compared with 39.6% ($n = 42$) who were not White. A 2 x 4 cross-tabulation and Chi-Square analysis showed that any associations between *Ethnicity* and *Victim release location* type were not significant ($\chi^2 = (3) = 0.50$, $p = .48$). The phi coefficient was used as a measure of effect size and this showed a small effect ($\phi = 0.06$).

7.3.1.2.3 Ethnicity and Transportation type

Appendix 20 shows that 96.0% of offenders ($n = 24$) who were White travelled on foot only, whilst 91.5% ($n = 97$) who were not White travelled in the same manner. A Chi-square analysis showed that there was no significant association between *Ethnicity* and *Transportation type* ($\chi^2 = (1) = 0.58$, $p = .45$). The phi coefficient was used as a measure of effect size and this showed a small effect ($\phi = 0.07$).

7.3.1.2.4 Ethnicity and Individual offence behaviours

Appendix 21 shows the results from cross-tabulating each *Individual offence behaviours* and *Ethnicity*. There were no significant associations and all effect sizes were small.

7.3.1.3 Distance travelled to Initial approach location

7.3.1.3.1 Distance travelled to Initial approach location and Geo-mobility style

Appendix 22 shows how the *Geo-mobility styles* differed in terms of median *Distance to Initial approach location*. Those offenders used the *Geo-mobility style* of *Intruded* had a longer median distance of 5.03 km, as opposed to *Abducted* (*Mdn* = 4.10 km), *Followed* (*Mdn* = 1.76 km), and *Ambushed* (*Mdn* = 1.76 km). However, a Kruskal Wallis test showed that these differences were not significant ($\chi^2 = (3) = 5.62$, $p = .13$). An effect size was not calculated as there was no significant result and therefore, no subsequent Mann Whitney U

test.

7.3.1.3.2 Distance travelled to Initial approach location and Location type

As Appendix 23 shows, those initially approaching victims in an indoor location had a longer median distance travelled to this location than those who did not (Indoors, *Mdn* = 4.25 km; Outdoors, *Mdn* = 1.63 km). However, a Mann Whitney U test showed that this difference was not significant ($Z = 1.43$, $p = .15$) and that this had a small effect size ($r = 0.13$).

Similarly, as Appendix 24 shows, those offenders who attacked the victims in an indoor location had a longer median *Distance travelled to the Initial approach location* than those who did not (Indoors, *Mdn* = 4.10 km, Outdoors, *Mdn* = 1.67 km). Again, this difference was not found to be significant ($Z = 1.15$, $p = .25$) and the effect size was small ($r = 0.11$).

There was no real difference in the *Distances travelled to Initial approach location* in terms of the types of *Crime location* as shown in Appendix 25; those who committed the crimes indoors had a median distance of 2.02 km, whilst those who committed the crimes outdoors had a median distance of 2.08 km. This small difference was not found to be significant ($Z = 0.18$, $p = .86$) with a small effect size ($r = 0.02$).

Finally, when examining the type of victim release location (as shown in Appendix 26), it was found that offenders who did so in an indoor location had a median distance of 2.61 km compared with those who did not (*Mdn* = 1.66 km). Again, this difference was not found to be significant, using a Mann Whitney U test ($Z = 1.06$, $p = .29$) with a small effect size ($r = 0.10$).

7.3.1.3.3 Distance travelled to Initial approach location and Transportation type

Appendix 27 shows how offenders who travelled on foot had a larger median *Distance travelled to Initial approach location* than those who did not (2.21 km as opposed to 1.76 km). This difference was not found to be significant, using a Mann Whitney U test ($Z = -.50$, $p = .62$). The effect size was found to be small ($r = -0.04$).

7.3.1.3.4 Distance travelled to Initial approach location and Individual offence behaviours

Any differences between the presence and absence of *Individual offence behaviours* on the Distance travelled to Initial approach location were explored using descriptive statistics as shown in Appendix 28. There were no significant differences and all effect sizes were small.

7.3.1.4 Distance travelled to Crime location

7.3.1.4.1 Distance travelled to Crime location and Geo-mobility style

Appendix 29 shows how the *Geo-mobility styles* differed in terms of median *Distance to crime location*. Those offenders used the *Geo-mobility style* of *Intruded* had a longer median distance of 5.02 km, as opposed to *Followed* (*Mdn* = 1.82 km), *Abducted* (*Mdn* = 1.66 km) and *Ambushed* (*Mdn* = 1.12 km). However, a Kruskal Wallis test showed that these differences were not significant ($\chi^2 = (3) = 4.62$, $p = .20$). Effect size was not calculated as there were no significant results and therefore, no subsequent Mann Whitney U test.

7.3.1.4.2 Distance travelled to Crime location and Location type

As shown in Appendix 31, for *Initial approach location*, those offenders who approached the victims indoors had a higher median *Distance travelled to Crime location* than those who did not (Indoors, *Mdn* = 4.24 km; Outdoors, *Mdn* = 1.48 km). This difference was not shown to be significant however ($Z = 1.93$, $p = .05$) and yielded a small effect size ($r = 0.18$).

Similarly, as shown in Appendix 32, those who attacked the victims indoors had a higher median *Distance to Crime location* than those who did not (*Indoors*, *Mdn* = 2.77 km; *Outdoors*, *Mdn* = 1.49 km). This difference was also not shown to be significant ($Z = 1.56$, $p = .05$), with a small effect size ($r = 0.15$).

As Appendix 33 shows, for *Crime location type*, there was a change. For those who committed their offences inside, they had a shorter median *Distance to Crime location* than those who committed their offences outdoors or on transport (Indoors, *Mdn* = 1.31 km; Outdoors, *Mdn* = 2.13 km). Again, this difference was not significant ($Z = -1.12$, $p = .27$) with a small effect size ($r = -0.10$).

As Appendix 34 shows, when the offender released the victim in an indoor location, their median *Distance travelled to the Crime location* was only slightly further than those releasing the victim in an outdoor location (1.50 km as opposed to 1.76 km). This was not a significant difference ($Z = .03$, $p = .98$) and yielded a small effect size ($r = 0.0$).

7.3.1.4.3 Distance travelled to Crime location and Transportation type

As Appendix 35 shows, the distance travelled to the crime location was further when the offender was not just travelling on foot than when he was only travelling on foot (Mdn = 2.26 km as opposed to *Mdn* = 1.51 km). This was not a significant difference ($Z = -.92$, $p =$

.36) and yielded a small effect size (r = -0.09).

7.3.1.4.4 Distance travelled to Crime location and Individual offence behaviours

Any differences between the presence and absence of *Individual offence behaviours* on the *Distance travelled to Crime location* were explored using descriptive statistics as shown in Appendix 36. There were no significant results and all effect sizes were small.

7.3.1.5 Burglary offences

7.3.1.5.1 Burglary offences and Geo-mobility styles

As Appendix 37 shows, offenders who had a *Burglary offence* within their CRIS background had the highest percentage of the *Geo-mobility style Abducted* (44%, n = 16) then *Ambushed* (27.8%, n = 10), *Intruded* (16.7%, n = 6) and *Followed* (11.1%, n = 4). However, Chi-square analysis did not show that these differences were significant (χ^2 = (3) = 0.85, p = .84). The effect size was calculated using phi and this was found to be small (ϕ = 0.08).

7.3.1.5.2 Burglary offences and Location types

Appendix 38 shows, more offenders who had a *Burglary offence* in their CRIS background had initially approached the victim in an outside location (69.4%, n = 25) than those who had not (30.6%, n = 11). However, this difference was not found to be significant (χ^2 = (2) = 2.04, p = .15) with a small phi coefficient of -0.13.

This result was the same for the associations between *Burglary offences* and *Attack location type*, *Crime location type* and *Victim release type*. Percentages are shown in Appendix 38. None of these cross-tabulations was significant (*Attack location*, χ^2 = (1) = 0.13, p = .72; *Crime location* χ^2 = (1) = 0.23, p = .04; *Victim release location*, χ^2 = (1) = 0.49, p = .48). All tests yielded small effect sizes with phi values of 0.04, 0.04 and 0.06 respectively.

7.3.1.5.3 Burglary offence and Transportation type

As Appendix 39 shows, when examining possible associations between *Burglary offences* and *Transportation* types, it was found that 97.2% of offenders (n = 35) who had a *Burglary offence* in their background travelled by *Foot*, compared with 90.5% of offenders (n = 86) who did not have a *Burglary offence*. This was not a significant difference (χ^2 = (1) = 1.66, p = .20) and yielded a small effect size (ϕ = 0.11).

7.3.1.5.4 Burglary offences and Individual offence behaviours

Any associations between whether the offender had a *Burglary offence* in their background and the *Individual offence behaviours* exhibited are shown in Appendix 40. Please note that if a value for the Chi-Square statistic is missing, a Fisher's Exact test was carried out (as there was an expected frequency of five or less in at least 25% of the cells).

There were no significant associations and the effect sizes were small.

7.3.1.6 Criminal damages offences

7.3.1.6.1Criminal damages offences and Geo-mobility style

A 2 x 4 contingency table and subsequent Chi-square analysis could not be performed to examine the relationship between *Criminal damage offences* and *Geo-mobility style* because more than 25% of the cells had an expected frequency of less than five. Therefore, for this analysis, the variable *Geo-mobility* was 'collapsed' to become *Abducted* and *Not Abducted* (as this was the highest frequency *Geo-mobility style*) and a 2 x 2 cross-tabulation was considered instead. This is shown in Appendix 41. Within those cases where the offender abducted the victim, 22.4% had a previous *Criminal damage offence* in their history (n = 15), whilst 21.9% (n = 14) did not. This difference was not found to be significant (χ^2 = (1) = 0.01, p = .94) and had a small effect size (ϕ = -0.01).

7.3.1.6.2 Criminal damage offences and Location type

The relationship between *Location type* and *Criminal damage offences* are shown in Appendix 42.

For those with a *Criminal damage offence* in their CRIS history, 27.6% (n = 8) had initially approached the victim indoors; whilst for those without a *Criminal damage offence* within their history, this figure was 20.6% (n = 21). This difference was not significant (χ^2 = (1) = 0.64, p = .42) and had a small effect size (ϕ = -0.07).

There were 27.6% of offenders (n = 8) who attacked their victim inside and also had a *Criminal damage offence* in their history, whilst 23.5% (n = 24) who attacked the victim inside did not. Again this difference was not significant (χ^2 = (1) = 0.20, p = .65) and yielded a small effect size (ϕ = -0.04).

For the type of *Crime location*, 31.0% of offenders (n = 9) who had a *Criminal damage offence* committed the offence indoors, whilst 38.2% (n = 39) committed the offence indoors and did not have a *Criminal damage offence* in their history. This again was not

found to be significant using Chi-Square analysis (χ^2 = (1) = .50, p = .48), with small effect size (ϕ = 0.06).

Finally, 34.5% (n = 10) who had a *Criminal damage offence* in their history committed their offence indoors, whilst 39.2% (n = 40) did not. This was not significant (χ^2 = (1) = 0.21, p = .64), with small effect size (ϕ = 0.04).

7.3.1.6.3 Criminal damage offences and Transportation type

Appendix 43 shows cross-tabulations between *Criminal damage offences* and *Transportation type*. As this shows, 96.6% of offenders (n = 28) who had a *Criminal damage offence* in their background travelled on foot, whilst 91.2% (n = 93) who did not have a *Criminal damage offence* in their background travelled on foot. This difference was not found to be significant (χ^2 = (1) = 0.93, p = .34). Using the phi coefficient as an effect size showed this to have a small effect size (ϕ = 0.08).

7.3.1.6.4 Criminal damage offences and Individual offence behaviours

Appendix 44 shows the results for the cross-tabulations between *Individual offence behaviours* and *Criminal damage offences*. There were no significant associations (using Chi-Square analysis or Fisher's Exact tests). All effect sizes were small.

7.3.1.7 Drugs offences

7.3.1.7.1 Drugs offences and Geo-mobility style

Appendix 45 shows the results for the cross-tabulations between *Drugs offences* and *Geo-mobility style*. Those who had abducted their victims had the highest percentage of *Drugs offences* in their background (56.1%, n = 23). This was followed by those who had followed their victims (17.1%, n = 7), those who had ambushed their victims and those who had intruded into their victims' house (12.2%, n = 5). Chi-square analysis did not show that these differences were significant however (χ^2 = (3) = 3.69, p = .30) and there was a small effect size (ϕ = 0.08).

7.3.1.7.2 Drugs offences and location type

Appendix 46 shows that more offenders who approached the victim in an indoor location did not have a *Drugs offence* (23.3%, n = 21) as opposed to those who did (19.5%, n

= 8). This difference was not found to be significant (χ^2 = (1) = 0.24, p = .63), with a small effect size (ϕ = 0.04).

This also shows the same pattern for *Attack location*, with 19.5% of offenders (n = 8) who attacked their victims having a *Drugs offence*, whilst 26.7% did not (n = 24). This was not found to be a significant association (χ^2 = (1) = 0.78, p = .08), with a small effect size (ϕ = 0.08).

There was a slight difference when it came to the *Crime location*. Here, 39.0% of offenders (n = 16) who committed the crime indoors also had a *Drugs offence* in their background, whilst 35.6% (n = 32) did not. Again, this difference was not found to be significant (χ^2 = (1) = 0.15, p = .70) and yielded a small effect size (ϕ = -0.03).

Finally, when the victim was released in an indoor location, 34.1% of offenders (n = 14) also had a *Drugs offence* within their background, whilst 40% (n = 36) did not. This was again not found to be significant (χ^2 = (1) = 0.41, p = .52), with a small effect size (ϕ = 0.06).

7.3.1.7.3 Drugs offences and Transportation type

As Appendix 47 shows, there is no real difference between those offenders who travelled on foot who had a *Drugs offence* within their background and those who did not have a *Drugs offence* within their background but had travelled on foot (92.7%, n = 38) compared with 92.2%, (n = 83). Unsurprisingly, this association was not found to be significant using Chi-Square analysis (χ^2 = (1) = 0.01, p = .27), with a small effect size (ϕ = 0.01).

7.3.1.7.4 Drugs offences and Individual offence behaviours

Appendix 48 shows the results for the cross-tabulations between *Individual offence behaviours* and *Drugs offences*. There were no significant associations (using Chi-Square analysis or Fisher's Exact). All effect sizes were small.

7.3.1.8 Fraud offences

7.3.1.8.1 Fraud offences and Geo-mobility style

A 2 x 4 contingency table and subsequent Chi-square analysis could not be performed to examine the relationship between *Fraud offences* and *Geo-mobility style* because more than 25% of the cells had an expected frequency of less than five. Therefore, for this analysis, the variable *Geo-mobility* was 'collapsed' to become *Intruded* and *Not Intruded* (as this did

not violate the assumption) and a 2 x 2 cross-tabulation was considered instead. This is shown in Appendix 49. Within those cases where the offender had a previous *Fraud offence* within their history, 33.3% (*n* = 3) had intruded, whilst 13.1% (*n* = 16) had intruded but did not have a *Fraud offence* within their background. This difference was not found to be significant (χ^2 = (1) = 2.76, *p* = .10) and had a small effect size (ϕ = 0.01).

7.3.1.8.2 Fraud offences and Location type

As Appendix 50 shows, out of the offenders who had a *Fraud offence,* 33.3% (*n* = 3) had approached the victim in an indoor location, whilst 21.3% (*n* = 26) approached the victim indoors but did not have a *Fraud offence* in their background. This difference was not significant (χ^2 = (1) = 0.70, *p* = .40) with a small effect size (ϕ = 0.07).

Of the offenders who had a *Fraud offence* in their background, 33.3% (*n* = 3) attacked the victim inside, whilst 23.8% (*n* = 29) did not have a *Fraud offence* in their background and attacked the victim inside. Again, this difference was not significant (χ^2 = (1) = 0.42, *p* = .52) with a small effect size (ϕ = 0.06).

There was a slight difference when the *Crime location* was inside. When the offenders had a *Fraud offence* in their background, 44.4% (*n* = 4) committed the offence inside, whilst 36.1% (*n* = 44) who committed their offence outside did not have a *Fraud offence* in their background. Again, this difference was not significant, using a Chi-square test (χ^2 = (1) = 0.25, *p* = .62), with a small effect size (ϕ = 0.04).

Finally, 44.4% (*n* = 4) of the offenders had a *Fraud offence* released the victim inside whilst 37.7%% (*n* = 46) released the victim in an indoor location but did not have a *Fraud offence* in their background. However, the Chi-square analysis did not show that this was significant (χ^2 = (1) = 0.16, *p* = .69) with a small effect size (ϕ = 0.04).

7.3.1.8.3 Fraud offences and Transportation type

The relationship between *Fraud offences* and *Transportation type* was examined using a cross-tabulation and a Chi-square analysis, results of which are shown in Appendix 51. It was found that 88.9% (*n* = 8) of offenders who had a *Fraud offence* in their background travelled on foot, whilst 92.6% (*n* = 113) did not have a *Fraud offence* but travelled on foot. This was not found to be significant (χ^2 = (1) = 0.17, *p* = .68) with a small effect size (ϕ = -0.04).

7.3.1.8.4 Fraud offences and Individual offence behaviours

Cross-tabulations and Chi-square analyses were carried out to examine the relationship between *Fraud offences* and *Individual offence behaviours*, the results of which are shown in Appendix 52. There were no significant differences and all effect sizes were small.

7.3.1.9 Motoring offences

7.3.1.9.1 Motoring offences and Geo-mobility style

It was not possible to carry out Chi-square analysis to examine the possible relationship between *Motoring offences* and any *Geo-mobility style* as all possible cross-tabulations violated the assumption of the Chi-square analysis (no less than 25% of cells had expected frequency of less than 5%).

7.3.1.9.2 Motoring offences and Location type

As Appendix 53 shows, for those offenders had a *Motoring offence* within their background, 50% (n = 2) initially approached their victims indoors, whilst 50% (n = 2) approached the victim outside. This was not found to be a significant difference using Fisher's Exact test (p = .21), with a small effect size (ϕ = 0.21).

For those offenders who had a *Motoring offence* within their background, 50% (n = 2) had attacked their victim in an inside location whilst 50% (n = 2) had attacked their victim in an outside location. This was not found to be a significant difference using Fisher's Exact test (p = .25) with a small effect size (ϕ = 0.11).

For those offenders who had a *Motoring offence* within their background, 50% (n = 2) had committed the offence within an indoors location whist 50% (n = 2) did not. This was not found to be a significant difference using Fisher's Exact test (p = .62) with a small effect size (ϕ = 0.05).

Finally, 50% (n = 2) who had a *Motoring offence* within their background released the victim inside, whist 50% (n = 2) did not. This was not found to be a significant difference using Fisher's Exact test (p = .64) with a small effect size (ϕ = 0.04).

7.3.1.9.3 Motoring offences and Transportation type

As Appendix 54 shows, 100% (*n* = 4) of offenders had a *Motoring offence* also travelled by foot to the offence, whilst 0% (*n* = 0) travelled by other means. A Fisher's Exact test did not show this was significant (*p* = 1.00), with a small effect size (ϕ = 0.05).

7.3.1.9.4 Motoring offences and Individual offence behaviours

Appendix 55 shows the cross-tabulations between *Motoring offences* and *Individual offence behaviours* and subsequent Fisher's Exact analysis. There were no significant associations and all effect sizes were small.

7.3.1.10 Robbery offences

7.3.1.10.1 Robbery offences and Geo-mobility style

Appendix 56 shows the cross-tabulations between *Robbery offences* and *Geo-mobility styles*. There were 53.7% of offenders (*n* = 22) who had a *Robbery offence* and who had used the *Abducted* style, whilst 29.3% (*n* = 12) had used the *Ambushed style*, 12.2% (*n* = 5) had used the *Followed style* and 4.9% (*n* = 2) had used the *Intruded style*. These differences were not found to be significant, using Chi-square analysis (χ^2 = (1) = 4.91, *p* = .18), with a small effect size (ϕ = 0.19).

7.3.1.10.2 Robbery offences and Location type

As Appendix 57 shows, it was found that 14.6% (*n* = 6) offenders with a *Robbery offence* in their background had approached the victim inside, as opposed to 25.6% (*n* = 23) who committed the offence in an inside location but did not have a *Robbery offence* in their background. However, a Chi-square test showed that this difference was not significant (χ^2 = (1) = 1.95, *p* = .18). The effect size was calculated using the Phi coefficient, and showed a small effect size (ϕ = 0.12).

In terms of *Attack location*, it was found that 9.8% (*n* = 4) of those offenders who had a *Robbery offence* in their background approached the victim in an indoor location, as opposed to 31.1% (*n* = 28) of offenders who approached the victim in an indoor location but did not have a *Robbery offence* in their background. However, a Chi-square test showed that this difference was not significant (χ^2 = (1) = 6.96, *p* = .01). The effect size was calculated using the Phi coefficient, and showed a small effect size (ϕ= 0.23).

For *Crime location*, it was found that 34.1% of those offenders who a *Robbery offence* in their background committed their offence in an indoor location, as opposed to 37.8% (*n* = 34) who committed the offence in an indoor location but did not have a *Robbery offence* in their background. However, a Chi-square test showed that this difference was not significant (χ^2 = (1) = 0.16, *p* = .69). The effect size was calculated using the Phi coefficient, and showed a small effect size (ϕ= 0.04).

For *Victim release location*, it was found that 31.7% of those offenders (*n* = 13) who had a *Robbery offence* in their background released their victim inside, as opposed to 41.1% (*n* = 37) who released their victim inside but did not have a *Robbery offence* in their background. However, a Chi-square test showed that this difference was not significant (χ^2 = (1) = 1.06, *p* = .30). The effect size was calculated using the Phi coefficient, and showed a small effect size (ϕ= 0.09).

7.3.1.10.3 Robbery offences and Transportation type

Appendix 58 shows the 2 x 2 cross-tabulations between *Robbery offences* and *Transportation type*. This shows that 97.6% (*n* = 40) of those with a *Robbery offence* travelled only on foot, whilst 90% (*n* = 81) of those without a *Robbery offence* travelled on foot. This difference was not shown to be significant (χ^2 = (1) = 2.28, *p* = .13), with a small effect size (ϕ= 0.13).

7.3.1.10.4 Robbery offences and Individual offence behaviours

The cross-tabulations between *Robbery offences* and *Individual offence behaviours* and the subsequent Chi-square analysis or Fisher's Exact test are shown in Appendix 59. There were no significant associations and all effect sizes were small.

7.3.1.11 Sexual offences

7.3.1.11.1 Sexual offences and Geo-mobility style

Appendix 60 shows cross-tabulations between *Sexual offences* and *Geo-mobility style*. This showed that 43.2% (*n* = 16) of offenders with a *Sexual offence* in their background had *Abducted* their victim in the present sample, 24.3% (*n* = 9) of offenders had *Ambushed* their victims, and 16.2% (*n* = 6) of offenders had either used the *Intruded* or *Followed* style (the same percentage for both). Any differences found within the cross-tabulations, however, were

not found to be significant in the subsequent Chi-square analysis ($\chi^2 = (3) = 0.86$, $p = .83$) with a small effect size ($\phi = 0.08$).

7.3.1.11.2 Sexual offences and Location type

As Appendix 61 shows, there were 24.3% ($n = 9$) of offenders who had a *Sexual offence* in their background, who also initially approached their victims indoors; this is opposed to 21.3% ($n = 20$) of offenders who did not have a *Sexual offence* in their background. These results were not found to be significant ($\chi^2 = (1) = 0.14$, $p = .71$), with a small effect size ($\phi = -0.03$).

There was a slightly higher percentage of offenders with a *Sexual offence* in their background who had attacked the victim within an indoor location (27.0%, $n = 10$) compared with those who did not have a *Sexual offence* in their background (23.4%, $n = 22$). Again, this result was not found to be significant ($\chi^2 = (1) = 0.19$, $p = .66$), with a small effect size ($\phi = -0.04$).

The percentage of offenders who had committed the offence inside and who also had a *Sexual offence* in their background was 43.2% ($n = 16$), compared with 34.0% ($n = 32$) of offenders who did not have a *Sexual offence* in their CRIS history. This association was not found to be significant ($\chi^2 = (1) = 0.97$, $p = .35$), with a small effect size ($\phi = -0.09$).

Lastly, the percentage of offenders who had released the victim inside and who also had a *Sexual offence* in their background was 48.6% ($n = 18$), compared with 34.0% ($n = 32$) who did not have a *Sexual offence* on CRIS. Again, this difference was not found to be significant ($\chi^2 = (1) = 2.40$, $p = -.14$) with a small effect size ($\phi = -0.14$).

7.3.1.11.3 Sexual offences and Transportation type

Appendix 62 shows the cross-tabulations between *Sexual offences* and *Transportation type*. As this shows, 94.6% of offenders ($n = 35$) who had a *Sexual offence* in their background only travelled on foot to the offence, compared with 91.5% ($n = 86$) who did not have a *Sexual offence* in their background. A Fisher's Exact test was used (as the assumption to carry out a Chi-square was violated) and did not show a significant difference ($p = .72$), with a small effect size ($\phi = 0.05$).

7.3.1.11.4 Sexual offences and Individual offence behaviours

The cross-tabulations between *Sexual offences* and *Individual offence behaviours* and the subsequent Chi-square analysis or Fisher's Exact test are shown in Appendix 63.

There were no significant associations and all effect sizes were small.

7.3.1.12 Theft offences

7.3.1.12.1 Theft offences and Geo-mobility style

Appendix 64 shows cross-tabulations between *Theft offences* and *Geo-mobility style*. This showed that 55.4% of offenders (n = 31) with a *Theft offence* in their background had *Abducted* their victim in the present sample, 21.4% (n = 12) of offenders had *Ambushed* their victims, 12.5% (n = 7) had *Followed* their victims and 10.7% (n = 6) had used the *Intruded* style. Any differences found within the cross-tabulations, however, were not found to be significant in the subsequent Chi-square analysis (χ^2 = (3) = 2.04, p = .56) with a small effect size (ϕ= 0.13).

7.3.1.12.2 Theft offences and Location type

There were 16.1% (n = 9) of offenders who had a *Theft offence* in their background, who also initially approached their victims indoors; this is opposed to 26.7% (n = 20) of offenders who did not have a *Theft offence* in their background. These results are shown in Appendix 65 and were not found to be significant (χ^2 = (1) = 2.09, p = .15), with a small effect size (ϕ= 0.13).

There was a slightly lower percentage of offenders with a *Theft offence* in their background who had attacked the victim within an indoor location (17.9%, n = 10) compared with those who did not have a *Theft offence* in their background (29.3%, n = 22). Again, this result was not found to be significant (χ^2 = (1) = 2.29, p = .13), with a small effect size (ϕ= 0.13).

The percentage of offenders who had committed the offence inside and who also had a *Theft offence* in their background was 37.5% (n = 21), compared with 36.0% of offenders (n = 27) who did not have a *Theft offence* in their CRIS history. This difference was not found to be significant (χ^2 = (1) = 0.03, p = .86), with a small effect size (ϕ= -0.02).

Lastly, the percentage of offenders who had released the victim inside and who also had a *Theft offence* in their background was 35.7% (n = 20), compared with 40.0% (n = 30)

who did not have a *Theft offence* on CRIS. Again, this difference was not found to be significant (χ^2 = (1) = 0.62, p = .14) with a small effect size (ϕ= 0.04).

7.3.1.12.3 Theft offences and Transportation type

Appendix 66 shows the cross-tabulations between *Theft offences* and *Transportation type*. As this shows, 94.6% (n = 54) of offenders who had a *Theft offence* in their background only travelled on foot to the offence, compared with 89.3% (n = 67) who did not have a *Theft offence* in their background. A Chi-square test was did not show a significant difference (χ^2 = (1) = 2.29, p = .13), with a small effect size (ϕ= 0.04).

7.3.1.12.4 Theft offences and Individual offence behaviours

The cross-tabulations between *Theft offences* and *Individual offence behaviours* and the subsequent Chi-square analysis or Fisher's Exact test are shown in Appendix 67.

There were no significant Ch-square analysis results and all effect sizes were small.

7.3.1.13 Violent offences

7.3.1.13.1 Violent offences and Geo-mobility style

Appendix 68 shows cross-tabulations between *Violent offences* and *Geo-mobility style*. This showed that 46.1% (n = 35) of offenders with a *Violent offence* in their background had *Abducted* their victim in the present sample, 19.7% (n = 15) of offenders had used the *Intruded* style, 18.4% (n = 14) had *Ambushed* their victims and 15.8% (n = 12) of offenders *Followed* their victims. Any differences found within the cross-tabulations, however, were not found to be significant in the subsequent Chi-square analysis (χ^2 = (3) = 6.92, p = .08) with a small effect size (ϕ= 0.23).

7.3.1.13.2 Violent offences and Location type

There were 31.6% (n = 24) of offenders who had a *Violent offence* in their background, who also initially approached their victims indoors; this is opposed to 9.1% (n = 5) of offenders who did not have a *Violent offence* in their background. These results are shown in Appendix 70 and were not found to be significant (χ^2 = (1) = 9.36, p = .002), with a small effect size (ϕ= -0.27).

The percentage of offenders with a *Violent offence* in their background who had attacked the victim within an indoor location was 31.6% (n = 24) compared with those who

did not have a *Violent offence* in their background (14.5%, *n* = 8). This result was not found to be significant (χ^2 = (1) = 5.09, *p* = .03), with a small effect size (ϕ= -.20).

The percentage of offenders who had committed the offence inside and who also had a *Violent offence* in their background was 40.8% (*n* = 31), compared with 30.9% (*n* = 17) of offenders who did not have a *Violent offence* in their CRIS history. This difference was not found to be significant (χ^2 = (1) = 1.34, *p* = .25), with a small effect size (ϕ= 0.25).

Lastly, the percentage of offenders who had released the victim inside and who also had a *Violent offence* in their background was 40.8% (*n* = 31), compared with 34.5% (*n* = 19) who did not have a *Violent offence* on CRIS. Again, this difference was not found to be significant (χ^2 = (1) = 0.53, *p* = .47) with a small effect size (ϕ= -0.06).

7.3.1.13.3 Violent offences and Transportation type

Appendix 71 shows the cross-tabulations between *Violent offences* and *Transportation type*. As this shows, 93.4% (*n* = 71) of offenders who had a *Violent offence* in their background only travelled on foot to the offence, compared with 90.9% (*n* = 50) who did not have a *Violent offence* in their background. A Chi-square test did not show a significant association (χ^2 = (1) = 0.29, *p* = .59), with a small effect size (ϕ= 0.05).

7.3.1.13.4 Violent offences and Individual offence behaviours

The cross-tabulations between *Violent offences* and *Individual behaviours* and the subsequent Chi-square analysis or Fisher's Exact test are shown in Appendix 72. There were no significant associations found and all effect sizes were small.

7.3.1.14 Distance to previous offences

7.3.1.14.1 Distance to previous offence and Geo-mobility styles

As Appendix 73 shows, the highest median *Distance to previous offences* shown within the *Geo-mobility style*s was for *Intruded* (*Mdn* = 3.56 km, range from 0.25 km to 9.51 km). *Ambushed* had the next highest median *Distance to previous offence* at 2.55 km (range 0.49 km – 6.44 km), then *Abducted* which had a median *Distance to previous offence* of 2.24 km (range 0.00 km – 31.57 km) and finally, *Followed*, with a median *Distance to previous offence* of 1.80 km (range 0.58 km to 3.96 km). A Kruskal Wallis test was conducted to examine whether these differences were significant, which they were not (χ^2 = (3) = 4.66, *p* = .20). The effect size of Kruskal Wallis tests would usually be carried out if the result was

significant and after post-hoc Mann Whitney U tests had been undertaken between the various categories to see where the differences lay (Newcombe, 2005). As this result was not significant, the effect size was not calculated.

7.3.1.14.2 Distance to previous offence and Location type

As Appendix 74 shows, those initially approaching victims in an indoor location had a longer median *Distance travelled to previous offences* than those who did not (Indoors, *Mdn* = 2.85 km; Outdoors, *Mdn* = 2.33 km). However, a Mann Whitney U test showed that this difference was not significant (Z =0.56, p = .58) and that this had a small effect size (r = 0.06).

Similarly, as Appendix 75 shows, those offenders who attacked the victims in an indoor location had a longer median *Distance travelled to previous offences* than those who did not (*Indoors, Mdn* = 2.85 km, *Outdoor, Mdn* = 2.38 km). Again, this difference was not found to be significant (Z = 0.45, p = .66) and the effect size was small (r = 0.05).

As Appendix 76 shows, those who committed the crimes indoors had a median *Distance travelled to previous offences* of 2.24 km, whilst those who committed the crimes outdoors had a median *Distance travelled to previous offences* of 2.55 km. This difference was not found to be significant (Z = -0.57, p = .57) with a very small effect size (r = -0.09).

Finally, as Appendix 77 shows, when examining the type of *Victim release location*, it was found that offenders who did so in an indoor location had a median *Distance travelled to previous offences* of 2.18 km compared to 2.55 km for those who did not. Again, this difference was not found to be significant, using a Mann Whitney U test (Z = -0.79, p = .43) with a small effect size (r =-0.06).

7.3.1.14.3 Distance to previous offences and Transportation type

As Appendix 78 shows, it was found that those travelling on foot only had a shorter median *Distance travelled to previous offences* than those who used other methods of *Transportation* within their offence (*Foot*, *Mdn* = 2.31 km, *No Foot*, *Mdn* = 3.31 km). However, this difference was not found to be significant (Z = -1.65, p = .10) and had a small effect size (r =-0.18).

7.3.1.14.4 Distance to previous offences and Individual offence behaviours

Appendix 79 shows the results of descriptive and inferential tests examining the any differences between the *Distances to previous offences* when particular behaviours have been exhibited within the offence and when they have not.

There were no significant differences at the adjusted alpha level and all effect sizes were small.

7.3.1.15 Mean inter-point distance

7.3.1.15.1 Mean inter-point distance and Geo-mobility type

As Appendix 80 shows, the longest mean, *Mean inter-point distance between previous offences* shown within the *Geo-mobility styles* was for *Followed* (*M* = 6.78 km, *SD* = 7.57 km). *Ambushed* had the second longest mean, *Mean inter-point distance between previous offences* at 4.59 km (*SD* = 3.13 km), then *Intruded* which had mean, *Mean inter-point distance* between previous offences of 4.16 km (*SD* = 2.73 km) and finally, *Abducted*, with a mean, *Mean inter-point distance between previous offences* of 3.70 km (*SD* = 2.85 km). A One Way Analysis of Variance (ANOVA) was conducted to examine whether these differences were significant. Levene's test for homogeneity of variance was found to be violated, however [$F(3, 85) = 5.64$, $p < .01$]. Pallant (2007) suggests that Welsh and Brown-Forsythe tests should be carried out on the one-way ANOVA if this occurs. Both of these analyses did not yield significant results; the Welch test results were $F(3, 29.25) = 0.91$, $p = .45$, whilst the Brown-Forsythe test results were $F(3, 19.93) = 1.34$, $p = .29$). The effect size was calculated by using eta squared (η^2) derived from the results from the original One Way ANOVA by dividing the sums of squares between groups by the total sums of squares (Pallant, 2007). This was found to be small ($\eta = 0.26$).

7.3.1.15.2 Mean inter-point distance and Location type

As Appendix 81 shows, those initially approaching victims in an indoor location had a slightly shorter mean, *Mean inter-point distance for previous offences* than those who did not (Indoors, *M* = 4.38 km, *SD* = 2.67 km; Outdoors, *M* = 4.40 km, *SD* = 4.24). An independent t-test was carried out to examine whether this difference was significant. The Levene's test for homogeneity of variance found that the variances could be assumed to be equal [F (87) = 1.78, $p = .19$]. The t-test found that this difference was not significant [t (87) = -0.02, $p = .98$]. The effect size used here was Cohen's *d* (calculated using an Effect Size calculator from http://www.uccs.edu/~faculty/lbecker/).

The effect size calculated was considered small (*d* = -0.01).

Similarly, as Appendix 82 shows, those offenders who attacked the victims in an indoor location had a slightly shorter mean, *Mean inter-point distance for previous offences* than those who did not (*Indoors*, *M* = 4.26 km, *SD* = 2.86 km; *Outdoors*, *M* = 4.44 km, *SD* = 4.20). An independent t-test was carried out to examine whether this difference was significant. The Levene's test for homogeneity of variance found that the variances could be assumed to be equal [*F* (87) =0.87, *p* = .35]. The t-test found that this difference was not significant [*t* (87) = -0.19, *p* = .85]. The effect size calculated was considered small (*d* = -0.05).

As Appendix 83 shows, those who committed the crimes indoors had a mean, *Mean inter-point distance for previous offences* of 3.75 km (*SD* = 2.70 km), whilst those who committed the crimes outdoors had a mean distance of 4.78 km (*SD* = 4.46 km). An independent t-test was carried out to examine whether it this difference was significant. The Levene's test for homogeneity of variance found that the variances could be assumed to be equal [*F* (87) = 3.15, *p* = .08]. The t-test found that this difference was not significant [*t* (87) = -1.20, *p* = .23]. The effect size calculated was considered small (*d* = -0.28).

Finally, as Appendix 84 shows, when examining the type of *Victim release location*, it was found that offenders who released their victims in an indoor location had a shorter mean, *Mean inter-point distance for previous offences* of 3.91 km (*SD* = 2.87 km) compared with those who did not release their victims in an indoor location (*Mdn* = 4.68 km, *SD* = 4.41 km). The Levene's test for homogeneity of variance found that the variances could be assumed to be equal [*F* (87) = 1.68, *p* = .20]. The t-test found that this difference was not significant [*t* (87) = -0.91, *p* = .37]. The effect size calculated was considered small (*d* = -0.21).

7.3.1.15.3 Mean inter-point distance and Transportation type

As Appendix 85 shows, offenders travelling by foot only had a shorter mean, *Mean inter-point distance for previous offen*ces than those who did not (*Foot*, *M* = 4.04 km, *SD* = 3.06 km; *No foot*, *M* = 10.31 km, *SD* = 9.79 km). An independent t-test was carried out to examine whether this difference was significant. The Levene's test for homogeneity of variance found that the variances could not be assumed to be equal [*F* (87) = 18.71, *p* < .001]. Therefore, equal variances were not assumed and the appropriate t-test was performed. This difference was not significant [*t* (4.05) = -1.43, *p* = .23]. However, the effect size was found to be large (*d* = 0.86) (Cohen, 1988).

7.3.1.15.4 Mean inter-point distance and Individual offence behaviours

Appendix 86 shows the mean, *Mean inter-point distances* for the presence and absence of each *Individual offence behaviour* and respective Independent t-tests. Levene's test for homogeneity of variance was carried out for all of these tests and it was found that there were no violations and that the variances should be assumed to be equal. Thus, the test output given is that where equal variances have been assumed.

There was a significant difference, in terms of mean, *Mean inter-point distances*, between those offenders who had exhibited the behaviour *Anal penile* and those who had not. Those who had penetrated the victim's anus with their penis had a mean distance of 7.15 km (*SD* = 5.85 km), whilst those who had not had a shorter mean distance of 3.70 km (*SD* = 2.91 km). An independent t-test was carried out to examine whether this difference was significant, and found that it was [t (87) = 5.56, $p < .0001$]. The effect size was found to be moderate (d = 0.75) (Cohen, 1988).

Those who had sucked or kissed the victim's breasts had a mean, *Mean inter-point distance* of 2.11 km (*SD* = 2.33 km), whilst those who had not had a longer mean distance of 4.69 km (*SD* = 3.99 km). An independent t-test was carried out to examine whether this difference was significant, and found that it was not [t (87) = 1.99, p = .05]. However, the effect size was found to be moderate (d = .79) (Cohen, 1988). This could mean that, using a larger sample size, the test statistic would have reached significance.

7.3.1.16 Summary of significant results

In total, there were only three significant associations between the offender characteristics and the Spatial and *Individual offence behaviours*, as shown in Table 7.3.1.16.

Table 7.3.1.16: Significant associations between Offender characteristics and Spatial or Offence behaviours

Offender characteristics	Spatial or Offence behaviours
Age	Condom, Self-disclosure criminal
Mean inter-point distance	Anal penile

7.3.2 Assessing predictive accuracy

7.3.2.1 Logistic regressions

The predictive accuracy of the spatial and offence behaviours exhibited within the offences was first examined using logistic regression. As explained within the Methods section, any continuous *Offender characteristic* variables were dichotomised.
Before conducting these analyses, the assumptions of logistic regression were checked. Firstly, for each offender characteristic, the number of cases for each independent variable was examined. As Peduzzi et al., (1996) found, the number of 'events per variable' (EPV) should be over 10 to avoid 'major problems' with logistic regression. Therefore, only logistic regressions where the independent variable had more than 10 cases were used within the following analysis. Therefore, logistic regressions could be carried out for *Age more than median* and *Self-disclosure criminal* (n = 13) as the number of cases per variable was more than 10. Also, *Age more than median* and *Condom* (n = 23) and *Mean inter-point distance more than mean* and *Anal penile* (n = 24) had the required amount of cases to run the logistic regression

As the logistic regressions, were bivariate, there was no need to test the assumption of multicollinearity.

Outliers and influential cases were also assessed. Firstly, a baseline model was run (including all cases) to examine each of the *Offender characteristic*/*Spatial* or *Individual offence behaviour* pairings. Then, all outliers (which were considered those cases were their standard residual was less than 3.0 or more than 3.0) and influential cases (those whose Cook's distance is greater than 1.0) were removed. If the accuracy of the model with these cases removed was greater than the baseline model, the new model was used to assess the predictive accuracy of the particular aspect. However, no outliers or influential cases were found for these variables.

The logistic regressions were then performed and the results, by offender characteristic, are as follows.

7.3.2.1.1 Age

Aspects of the offences that were significantly associated with *Age more than median* were entered into the logistic regression model. The beta value (β), standard error (SE), significance of the predictor variable, chi square (χ^2) and significance of the model, and Cox and Snell variance estimate (R^2) are shown for *Condom* and *Self-Disclosure criminal* in Table 7.3.2.1.1

Table 7.3.2.1.1 Logistic regression analysis for Age

Offender characteristic	Behaviour	β	SE	Sig	Model χ^2	Model Sig	R^2	H&L test
Age	Condom	-1.20	0.49	*	6.42	*	0.05	$\chi^2 = (0) = 0$
	Constant	-0.38	0.20					
Age	Self-disclosure criminal	-2.05	0.79		9.34	**	0.07	$\chi^2 = (0) = 0$
	Constant	0.34	0.19					

Note. $^{*}p < .05$, $^{**}p < .01$

The logistic regression model for *Condom* was a significant fit to the data ($\chi^2 = (1) = 6.42$, $p < .05$), explaining 5% of the variance. This also had a significant beta value ($\beta = -1.20$, $p < .05$) and the odds ratio [odds ratio = exp (B)] was 0.30, suggesting that when those offenders who wore a condom were 0.30 times more likely to be aged more than the median age for all offenders.

The logistic regression model for *Self-disclosure criminal* was a significant fit to the data ($\chi^2 = (1) = 9.34$, $p < .05$), explaining 7% of the variance. This also had a significant beta value ($\beta = -2.05$, $p < .05$) and the odds ratio [odds ratio = exp (B)] was 0.13, suggesting that when those offenders who wore a condom were 0.13 times more likely to be aged more than the median age for all offenders.

7.3.2.1.2 Mean inter-point distance

Aspects of the offences that were significantly associated with *Mean inter-point distance more than mean* were entered into the logistic regression model. The beta value (β), standard error (SE), significance of the predictor variable, chi square (χ^2) and significance of the model, and Cox and Snell variance estimate (R^2) are shown for *Anal penile* in Table 7.3.2.1.2.

Table 7.3.2.1.2: Logistic regression analysis for Mean inter-point distance

Offender characteristic	Behaviour	β	SE	Sig	Model χ^2	Model Sig	R^2	H&L test
Mean inter-point distance	Anal Penile	1.69	0.58	***	9.41	***	0.1	χ^2 = (0) = 0
	Constant	-0.74	0.25					

Note. *** $p < .001$

The logistic regression model for *Anal penile* was a significant fit to the data ($\chi^2 = (1) = 9.41$, $p < .001$), explaining 10% of the variance. The beta value was also significant ($\beta = 1.69$, $p < .001$). The odds ratio was 5.43, suggesting that when the offender anally penetrated the victim, they were 5.43 more likely to have a mean inter-point distance more than the mean of 4.40 km.

All models provided different levels of predictive accuracy (the ability to correctly classify whether a case can be assigned to the particular offender characteristic) based on using the beta value and constant generated by the model), compared with randomly classifying a case based on random probability.

Based on random probability, the accuracy of using *Condom* to predict whether an offender had an *Age more than median* was 54.2%. When using the model, the accuracy increased to 61.1%.

Based on random probability, the accuracy of using *Self-disclosure criminal* to predict whether an offender had an *Age more than median* was 54.2%. When using the model, the accuracy increased to 61.1%.

Based on random probability, the accuracy of using *Anal penile* to predict the offender's *Mean inter-point distance more than the mean* was 59.6%. When using the model, the accuracy increased to 68.5%.

7.3.2.2 Receiver Operating Characteristic (ROC) analysis

The predicted probabilities generated by both of the models were then used within separate Receiver Operating Characteristics (ROC) analysis.

The ROC curves for each model were constructed and the Area under the Curve statistic was calculated to assess the predictive accuracy of using both to predict *Offender characteristics*.

7.3.2.2.1 Age more than median and Condom

Figure 7.3.2.2.1 shows the ROC curve for predicting whether the offender's age was more than the median age, from whether he used a condom.

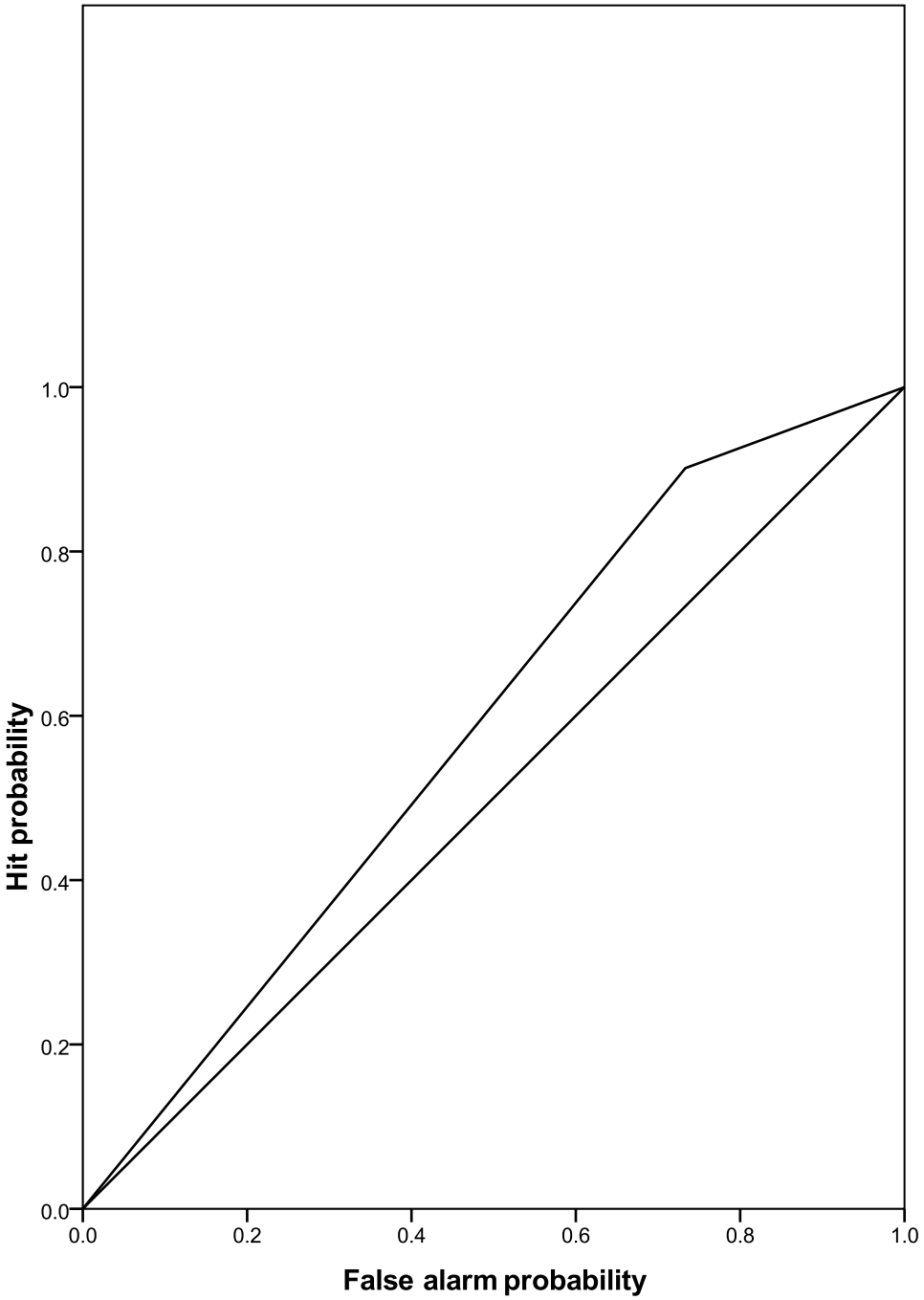


Figure 7.3.2.2.1 ROC curve for predictive accuracy for Age more than median, from Condom

The predictive accuracy of this model was not significant (AUC = 0.58, CI = 0.49-0.68, p = .05). The area under the curve statistic for predicting Age more than median of 0.58 is not deemed to be an acceptable level of predictive accuracy (Hosmer & Lemeshow, 2000).

7.3.2.2.2 Age more than median and Self-disclosure criminal

Figure 7.3.2.2.2 shows the ROC curve for predicting whether the offender was aged more than the median age of all offenders from whether he had disclosed details of his past offending behaviour (*Self-disclosure criminal*).

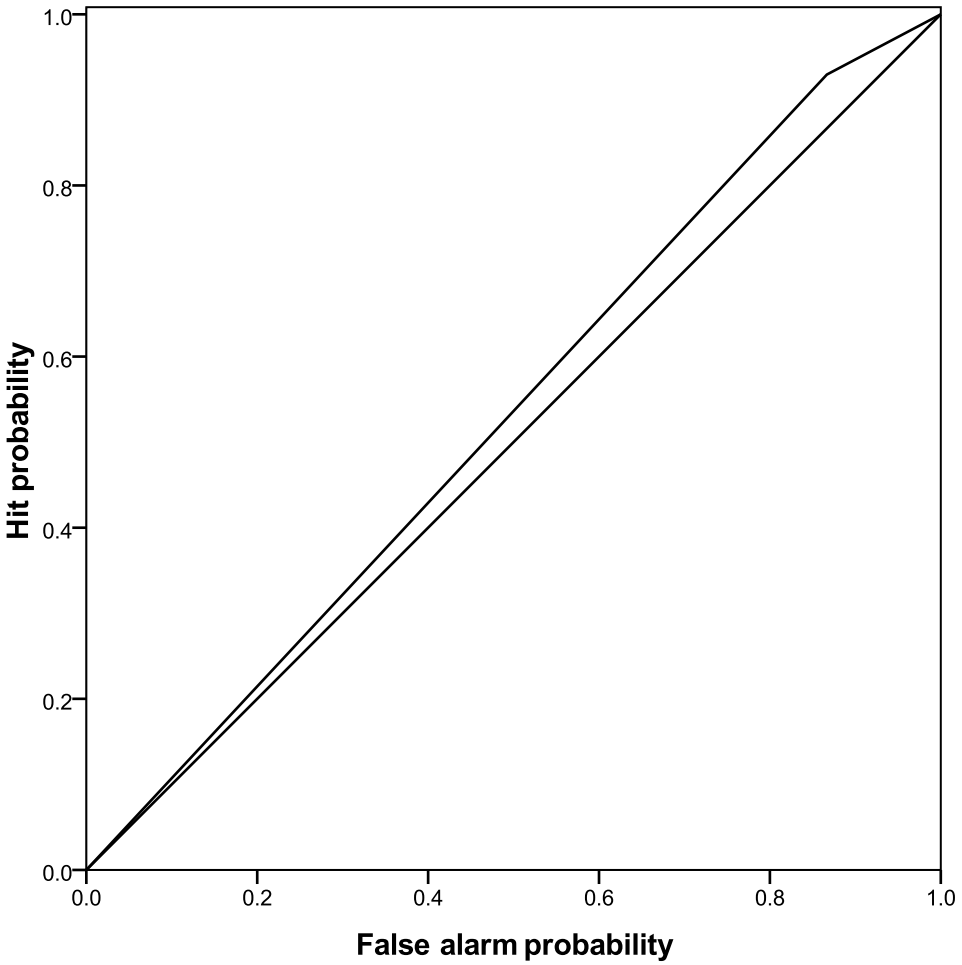


Figure 7.3.2.2.2 ROC curve for predictive accuracy for Age more than median, from Self-disclosure criminal

The predictive accuracy of this model was not significant (AUC = 0.53, CI = 0.43-0.63, p = .54). The area under the curve statistic for predicting *Age more than median* was

0.53 which is not deemed to be an acceptable level of predictive accuracy (Hosmer & Lemeshow, 2000).

7.3.2.2.3 Mean inter-point distance more than mean

Figure 7.3.2.2.3 shows the ROC curve for predicting whether the offender had a mean, *Mean inter-point distance to previous offences* which was more than the mean for all offenders, from whether he anally penetrated his victim.

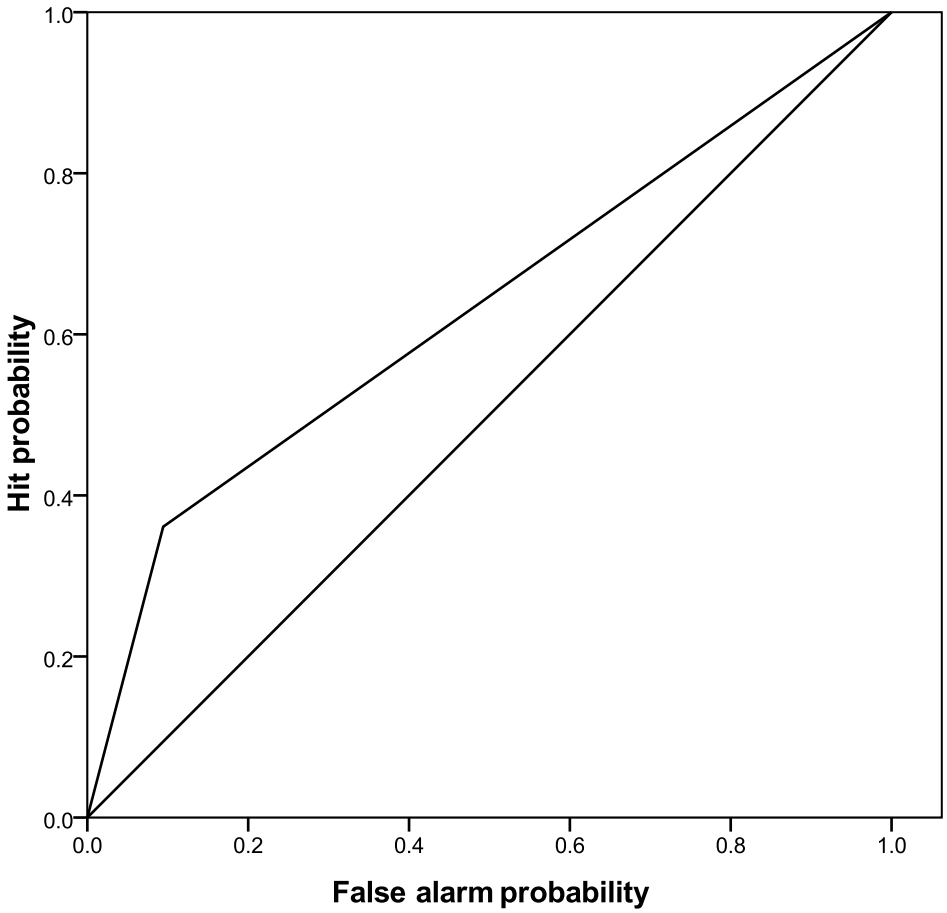


Figure 7.3.2.2.3 ROC curve for predictive accuracy for Mean inter-point distance more than the mean, from Anal penile

The predictive accuracy of the *Mean inter-point distance more than mean* and *Anal penile* was significant (AUC = 0.63, CI = 0.51- 0.76, $p < .05$). However, this area under the

curve statistic of 0.63 is not deemed to be an acceptable level of predictive accuracy (Hosmer & Lemeshow, 2000).

7.4 Chapter summary

The present chapter aimed to examine whether the *Geo-mobility styles* were significantly related to offender background characteristics. If these were, the aim was to see how accurate the styles were at predicting these. The results showed, however, that these styles were not significantly associated with any of the characteristic variables. Moreover, the study found that only three offence behaviours were related to the characteristics and that none of these produced an acceptable level of accuracy for prediction.

The reasons why the *Geo-mobility styles* were not related to offender background characteristics may be because even these sorts of behaviour may be heavily influenced by other situational factors (other than the physical environment). For example, it can be considered that the *Ambushed* and *Followed* offences may be very similar; within both offence styles, the offender uses broad styles of violence. It could be that they are closely related and that *Ambushed* offences could 'turn into' *Followed* offences, depending on the travel direction of the victim or the amount of people around.

The three significant relationships between the offender background characteristics and the offence behaviours could show that a few offence behaviours may be more useful than others for offender profiling and/or suspect prioritisation. The large number of tests carried out within this chapter (one of its limitations) meant that the alpha level used was extremely small (the Bonferroni correction). Future research could consider small numbers of carefully selected variables or groups of variables, the use of which may improve predictive accuracy. It is argued that this selection must be carried out with close consideration to both theory and those behaviours that are pragmatically useful, such as those considered within Goodwill and Alison (2007).

The implication of these results, in terms of homology, is that this could not be established within this chapter and supports the findings of Mokros and Alison (2002) and others. It could be that examining the geo-behavioural nature of stranger rape may be useful in terms of how it explains the dynamic and fluid nature of the rape event but may be less useful in terms of practical, investigative work. The relationship between the *Geo-mobility styles* and the behavioural themes (as outlined in Chapter Six) shows that the context of the rape may have an effect on the broad behavioural nature of the offence, and vice versa. The findings of this chapter have practical implications for offender profiling. It shows that it is

difficult to predict offender characteristics from specific behaviours, even when a large number and variety of behaviours are used.

The main limitation of this chapter is that there were a large number of tests carried out, which affected the alpha level used. However, although there were few cases where a significant association was found, there were also some large effect sizes reported. This could mean that, with more cases, a 'more' significant result could be found. These associations may therefore warrant further attention. This method used to examine whether offence behaviours could be used to predict offender characteristics (logistic regression) assumes that any relationships found are independent from situational influences or other variables, which is not (always) the case (as seen in Goodwill & Alison, 2007). Thus, others have used full logistic models to try to examine which offence variables are still predictive even with the impact of other variables (Goodwill, Alison, & Beech, 2009). However, using such a method could violate one of the main assumptions of logistic regression; if variables are too highly correlated, then they could cause the problem of multicollinearity (Tabachnick & Fidell, 1996). The large standard errors cited within some of the multivariate models within Goodwill et al., (2009) may have been caused as a result of this. Equally, independent variables at the end of a list of inputted variables will 'drop out' of full model regression analysis. Thus, although the present author accepts the theoretical limitation of using bivariate correlations, it was thought that this would be more statistically viable. Future research could explore any particular combinations of geo-mobility and behaviour and their use in predicting particular background characteristics, similar to Goodwill and Alison (2007).

In summary, this chapter did not find empirical support for the ability of either *Geo mobility styles* or other behaviours to predict offender characteristics. This has practical implications and does not provide support for the homology assumption. The next chapter discusses how and if *Geo-mobility styles* and other behaviours can be used for the case linkage.

CHAPTER EIGHT
CASE LINKAGE

8.1 Introduction

8.1.1 Summary of case linkage research

As Chapter One outlines, case linkage relies on two assumptions; that offenders will behave consistently across a series of offences (Offender consistency hypothesis, Canter, 1995) and that this behaviour will differ, in some way, to that of the behaviour of other offenders who commit the same kinds of crimes (Inter-offender variation, Goodwill & Alison, 2007). A number of studies have examined whether aspects of offenders' behaviour are consistent across a series, or across two crimes. Salfati and Bateman (2005), for example, examined consistency in serial homicide. Using cases derived from the database held at the Homicide Investigation and Tracking System (HITS) in the USA, the researchers considered whether behavioural themes of Expressive and Instrumental aggression found in their sample (derived from multidimensional scaling) were exhibited consistently across a series of three offences. Salfati and Bateman (2005) found that offenders were fairly consistent in the type of aggressive theme they exhibited throughout the three offences.

Woodhams and Toye (2007) found that linked robbery offences exhibited a significantly greater level of consistency across pairs than unlinked offences, in the behavioural domains of target selection (such as type of premises, time of day), planning (for example, wearing a mask) and control (such as the use of weapons to control).

Grubin et al., (2001) examined behavioural consistency within rape offences. The researchers found that consistency could be established in terms of the behavioural domains that were exhibited; for serial offenders within the UK database, 83% of offenders were exhibited single domain consistency and 26% showed consistency in all four domains. The most consistent domains were found to be Control and Escape, whilst less consistency was established for Sex and Style domains. Using the ROC methodology, Bennell et al., (2009) found that linked serial rapes exhibited a higher level of behavioural similarity in comparison to unlinked rapes. They also found that overall behavioural similarity (measured using the Jaccard's measurement) could be used to predict that offences were linked to a good level of accuracy. Similarly, Yokota et al., (2007) found that serial sexual assaults could be linked together using behavioural similarity and that this overall offence behaviour could be used to accurately link offences to a common offender in nearly 30% of cases (n = 81).

On the whole, researchers have found that inter-crime proximity is a consistent and accurate way of linking offences together. For example, Bennell and Canter (2001) found that this was more accurate than other behavioural domains at predicting whether pairs of burglaries were linked. As discussed in Chapter One, it is thought that spatial behaviour is relatively consistent across offences because a) offenders do not usually travel far to commit their offences (for example, Rhodes & Conly, 1981) b) they tend to commit crimes within areas which they are familiar with (C/F Routine Activity Theory, Cohen & Felson, 1979) and c) because choosing the location within which the offences are to occur may be more within the control of the offender than other, more situationally dependent behaviours (C/F Funder & Colvin, 1991; Bennell & Jones, 2005).

8.1.2 Rationale and research questions

This chapter aims to examine whether the *Geo-mobility styles* are accurate predictors of case linkage. It is argued that, as these models are based on the spatial behaviour of offenders and that they incorporate aspects of the offenders' behaviour that are more within their 'control' (that is *Initial approach location*), these styles will be accurate predictors of case linkage. In summary, therefore, this chapter aims to:

- Assess whether geo-mobility styles are consistent and yield inter-offender variation across linked pairs of stranger rapes
- Consider whether the geo-mobility styles are more accurate than individual spatial and offence behaviours at predicting case linkage.
- Examine whether inter-initial approach proximity is a more accurate predictor of case linkage than inter-crime proximity.

8.2 Method

8.2.1 Sample

The entire serial stranger rape sample comprised of 17 offenders, committing 46 offences between them. The process of deriving this sample was explained in Chapter Two. The mean age, *at each offence*, was 24.98 (*SD* = 6.14), with a median age of 24. Ages ranged from 14 to 37. At the time of their first, recorded offence, the mean age of offenders was 24.18 (*SD* = 6.70), with a median age of 24. In terms of ethnicity, 41.2% were White, 29.4% were Dark European, 23.5% were Afro-Caribbean and 5.9% were of Egyptian or Arabian appearance.

8.2.2 Procedure

The victim statements of all 46 offences were examined in order to identify *Geo-mobility styles* and *Individual offence behaviours* as the method described in Chapter Four and Five. This involved examining the text for instances of where the victim recounted the spatial and offence behaviour of the offender.

Inter-Initial Approach and *Inter-Crime distances* were derived from the address data within the victim statements and calculated in the method explained in Chapter Two. It must be noted that the *Attack* and *Victim release locations* were not used within this analysis because of the paucity of address data for these two locations.

Although some of the 17 series consisted of three or four offences, it was necessary to have the same number of offences in each series, which is common practice in linkage analysis research (Bennell & Canter, 2002; Bennell & Jones, 2005; Woodhams & Toye, 2007). Therefore, for series that consisted of more than two crimes, two were randomly selected (using a function in SPSS v.17©) for inclusion in the analysis. For the linkage analysis, 17 linked series were used, comprising of a total of 34 offences, two offences per offender. These will be referred to hereafter as the *Linked pairings.*

In order to examine how effective the spatial and offence behaviours were at linking offence, it was necessary to compare their results to that of an unlinked sample. Thus, a random sample of unlinked pairings was selected using a function in SPSS v.17©. These will be referred to hereafter as the *Unlinked pairings.*

A total of 34 crime pairings were therefore used in the linkage analysis; *17 Linked pairings, 17 Unlinked pairings.* For the linkage analysis within this chapter, the dependent variable will be whether a pairing is either *Linked* (‘1’) or *Unlinked* (‘0’), whilst the independent variables will be the various *Spatial behaviour* and *Individual offence behaviours* that have been derived from the victim statements.

8.2.3 Analysis

Geo-mobility styles and *Individual offence behaviours* were coded according to the definitions explained in Chapter Four and the content dictionary developed in Chapter Five. It must be noted that no new *Geo-mobility styles* or *Individual offence behaviours* were found by carrying out this analysis.

After the *Geo-mobility styles, Location types, Transportation type, Inter-Initial approach distances, Inter-crime distances,* and *Individual offence behaviours* were derived from the data, a descriptive analysis of these was carried out.

To assess whether the *Geo-mobility styles* were more effective at predicting linkage, two steps of analysis were conducted. Firstly, the difference between the *Linked pairings* and the *Unlinked pairings* was examined to establish whether the *Spatial* and *Individual offence behaviours* were more consistently exhibited within the *Linked pairings*. Similarity of dichotomous variables was measured by percentage of 'matches' between linked offences; thus, if the same behaviour was occurring from one offence to another. If the percentage of matches in the *Linked pairing* was significantly higher than the *Unlinked pairing*, similarity was established.

The overall patterns of behaviour were examined for similarity using Jaccard's coefficient (see Chapter Two for an explanation of this. So, the degrees of similarity of all of the offence behaviours was calculated for both *Linked* and *Unlinked pairings*; similarity was established if the median Jaccard coefficient in the *Linked pairings* was significantly higher than in the *Unlinked pairings*.

Similarity of distance measures (*Inter-initial approach* and *Inter-crime distances*) was calculated by comparing the median distance between the *Linked* and *Unlinked pairings*; if *Linked pairings* were found to be significantly shorter than *Unlinked pairings*, similarity was established.

Tests of significance were applied when comparing *Linked* versus *Unlinked pairings*. Appropriate measures of distribution were used to determine the appropriate inferential tests for any differences found.

The second stage of the linkage analysis was to examine aspects within *Linked pairings* (as opposed to *Unlinked pairings*) that could be used to predict linkage. This was carried out using bivariate logistic regression, where whether a pairing was linked or not was the dependent variable and the particular *Spatial* or *Individual offence behaviours* of the offence were the independent variables. Receiver Operating Characteristic (ROC) analysis was also used to measure predictive accuracy, to counter-act the violation that occurs when using a non-independent dependent variable in logistic regression (Woodhams & Toye, 2007).

Probabilities of pairing linkage are derived from the individual logistic regressions. ROC is used to assess how accurate the measure is at predicting linkage, using the 'Area under the Curve' measurement. Hosmer and Lemeshow (2000, p.162) outline that as a "general rule" the value of the Area under the Curve (A_z) measurement should be equal to or greater than 0.7 to be considered an "acceptable discrimination." For this reason, only aspects of the offences which yield AUCs over 0.7 were considered as accurate predictors of linkage.

The ROC curves were produced using SPSS v.17 (SPSS Inc Headquarters, Chicago, Illinois, USA).

For a full explanation of logistic regression and ROC analysis as well as their use in linkage studies, see Chapter One and Chapter Two.

As with other studies investigating the accuracy of linking with various aspects of the offences (Bennell & Jones, 2005; Woodhams & Toye, 2007), a Youden's J statistic was calculated to enable the optimum decision threshold for each measure to be calculated (Hilden, 1991). From this, the optimum value for determining whether two crimes are linked can be derived.

In summary, the data set used comprised of 34 stranger rapes. For the following descriptive analysis and the derivation of the *Geo-mobility themes* and *Individual offence behaviours*, all 46 offences were considered. For the linkage analysis, 17 *Linked pairings* and 17 *Unlinked pairings* were used. Comparisons were made between the *Linked pairings* compared with the *Unlinked pairings* in terms of their Spatial and *Individual offence behaviour* similarity as well as *Inter-Initial approach* and *Inter-crime proximity*. Logistic regression and Receiver Operating Characteristics analysis were carried out to determine whether these aspects could accurately predict linkage.

8.3 Results

8.3.1 Descriptive analysis of the serial stranger rape sample.

For the 17 stranger rape series, 17 offenders had committed 46 crimes; five offenders had committed four offences each, two offenders had committed three offences, and 10 offenders had each committed two offences. The offences took place between 1998 and 2007. The length of time between offences ranged from 3 hours apart to 9 years.

8.3.1.1 Geo-mobility

Within the linked sample, the highest percentage of *Geo-mobility style* was *Ambushed* (39.1%, *n* = 18), then *Followed* (28.3%, *n* = 13), *Abducted* (19.6%, *n* = 9) and then *Intruded* (13.0%, *n* = 6). This is different from the original sample where the distribution of the *Geo-mobility styles* within the 112 offences as being *Abducted* (44.6%), *Ambushed* (25.9%), *Intruded* (17.0%) and *Followed* (12.5%).

8.3.1.2 Location type

In terms of the *Initial approach locations*, the offender approached the victim in the *street* in 37% (*n* = 17) of offences. This was followed by a *park or common* (23.9%) (*n* = 11), the *victim's house* (13%) (*n* = 6), an *alleyway, footpath or subway* (10.9%) (*n* = 5), *other* locations (8.7%) (*n* = 4), *public transport* (2.2%) (*n* = 1) and a *train station* (2.2%) (*n* = 1). These percentages are similar to those for the original sample.

The *Attack location* was in the *street* in 34.8% of cases (*n* = 16), then a *park or common* in 23.9% of cases (*n* = 11), the *victim's house* in 17.4% of cases (*n* = 8, an *alleyway* in 15.2% of cases (*n* = 7), a *stairwell or lift* in 6.5% of cases (*n* = 3), and a *garden* in 2.2% of cases (*n* = 1). These percentages are similar to those for the original sample.

For the *Crime locations*, *park or common* was the most frequent (37%) (*n* = 17). Then, 17.4% of attacks occurred in the *street* (*n* = 8), 15.2% in an *alleyway or footpath* (*n* = 7), 15.2 occurred within the *victim's house* (*n* = 7) and 8.7% in a *stairwell or lift* area within a block of flats (*n* = 4). Other areas where an attack occurred included the *suspect's house*, the *victim's front garden*, and an outdoor *car park*, all 2.2% of cases (*n* = 1). Again, these locations are similar to that found in the original sample, although the percentage of attacks in *parks* was the most frequent here, whilst there were fewer attacks within the *victim's house*.

There was greater diversity in the types of location for the *Victim Release location*. Again, the highest number of cases involved the victim being released in the *street* (30.4%, *n* = 14), and then a *park or common* in 21.7% of cases (*n* = 10). The location was the *victim's house* in 17.4% of cases (*n* = 8), then an *alleyway* 13.0% (*n* = 6) and then a *stairwell or lift* in 6.5% of cases (*n* = 3). The *Victim Release location* was a *shop*, a *car park*, the *suspect's house*, a *garden* and a *taxi* for 2.2% of cases for each (*n* = 1).

8.3.1.3 Transportation type

The majority of offences in the serial sample involved the offender travelling only by *foot* (91.2%, *n* = 31), followed by a *bus* (5.9%, *n* = 2) and a bicycle (2.9%, *n* = 1).

The distribution of types of transportation in the original sample was as follows; *foot* 83%, *car or taxi* 7.1%, *bus* 6.3%, *bicycle* 2.7% and *train* 0.9%.

8.3.1.4 Distance travelled and previous spatial behaviour

The distance travelled between the *Initial approach* and the *Crime location* could be calculated for 43 of the offences. The mean distance travelled was 0.44 km (*SD* = 0.96 km), whilst the median distance travelled from *Initial approach* to *Attack location* was 0.07 km.

This median distance was shorter than that of the original sample (0.77 km). The range of distances was shorter, from 0 km to 4.73 km (as opposed to 12.57 km in the original sample), showing that the offenders within the serial sample do not travel as far as those within the original sample.

The distance travelled from base to *Initial approach location* could be measured within 35 of the 46 offences. The mean distance travelled was 3.23 km (*SD* = 3.90 km), with a median distance travelled of 1.46 km. The minimum distance travelled was 0.06 km, the maximum 14.59 km. Comparing the median distance travelled to the *Initial approach location* with that measured in the original sample, the offenders did not travel as far to approach their victims (1.46 km compared with 2.58 km). In terms of the distance travelled to the *Attack location*, this was slightly further; the mean distance was 3.32 km (*SD* = 3.61 km), with a median distance of 1.89 km. Thus, unlike the original sample those within the serial sample seem to be moving further away from their base, rather than closer to it. This might be due to the higher percentage of the *Geo-mobility style* of *Followed*; more offenders are following the victims, waiting for the opportunity to attack. Thus, the location of attack might be more influenced by the victims' routine activities and journey choice rather than the offenders'.

The *Inter-Initial approach distances* and *Inter-Crime distances* were measured for each offender. In terms of the former, the mean *Inter-Initial approach* distance for all offenders was 2.30 km (*SD* = 3.56). The median was much shorter at 0.66 km. The minimum *MID* for approach distances was 0.00 km and the maximum 14.58 km. Taking the inter-quartile range as perhaps a more accurate descriptive of the spread of scores, this ranged from 0.41 km to 3.07 km (therefore, the IQR = 2.66 km). For the mean *Inter-Crime distance*, the mean was slightly larger, at 2.91 km (SD = 3.26 km), but with a larger median of 1.34 km. Again, the *IQR* is probably a better indication of spread; the lower-quartile value (25% of scores) for Inter-Crime distances was 0.00 km and the higher-quartile value (75% of scores) was 12.25 km. It seems, therefore, that the *Inter-Initial approach distances* are more closely clustered together than the *Inter-Crime distances*.

8.3.1.5 Individual offence behaviours

The percentages of offence behaviours exhibited within the serial sample are listed in Table 8.3.1.5 below. In total, 82 offence behaviours were exhibited.

Table 8.3.1.5: Percentage of Individual offence behaviours within the Serial sub-sample

Behaviour	Percentage
Control violence	80.4
Surprise approach	54.3
Ordered sexual activity	52.2
Vaginal penile	52.2
Confidence approach	43.5
Ejaculated	41.3
Kissed	39.1
Conditional threat	34.8
Physical violence	34.8
Weapon to scene	34.8
Fellatio	32.6
Ordered no noise	32.6
Threatened physical violence	32.6
Disturbed	23.9
Multiple penetrations	23.9
Stole property	23.9
Threatened weapon	23.9
Anal penile	21.7
Multiple acts of violence	21.7
Self-disclosure personal	21.7
Unconditional threat	21.7
Non sexual questions	19.6
Verbal abuse	19.6
Ordered property	17.4
Complimented	15.2
Ordered undress	15.2
Ordered no report	15.2
Self-disclosure lie	15.2
Victim arousal	15.2
Masturbated hand	13.0
Self-disclosure criminal	13.0

Table 8.3.1.5: Percentage of Individual offence behaviours within the Serial sub-sample (continued)

Behaviour	Percentage
Tobacco smoked	13.0
Vaginal digital	13.0
Breasts	10.9
Rummaged	10.9
Endearment term	8.7
Ordered no look	8.7
Ordered redress	8.7
Bit	6.5
Bound	6.5
Joked or laughed	6.5
No speech	6.5
Offered pay	6.5
Ordered comment sexual	6.5
Sat or laid beside victim	6.5
Scripting verbal	6.5
Sexual questions	6.5
Tore clothing	6.5
Blindfolded material	4.3
Commented offender sexual arousal	4.3
Commented penis	4.3
Condom	4.3
Cuddled	4.3
Cunnilingus	4.3
Disguise	4.3
Erectile dysfunction	4.3
Excused or justified	4.3
Foreign language	4.3
Meet up	4.3
Ordered wait escape	4.3
Penis testicles pubic hair touched	4.3

Table 8.3.1.5: Percentage of Individual offence behaviours within the Serial sub-sample (continued)

Behaviour	Percentage
Stole underwear	4.3
Anal digital	2.2
Apologised	2.2
Blitz approach	2.2
Gagged hand	2.2
Left weapon	2.2
Look out	2.2
Multiple offenders	2.2
Made phone call	2.2
Marry	2.2
Multiple victims	2.2
Non-alcoholic drank	2.2
No hear	2.2
Offered assistance	2.2
Ordered comment non-sexual	2.2
Television radio	2.2
Slept	2.2
Spat hand	2.2
Swallowed	2.2
Taxi called	2.2
Vagina washed or cleaned	2.2

As with the original sample, *Control violence* was the most frequently occurring behaviour, observed in 80.4% of cases (n = 37). Other high frequency behaviours were *Surprise approach* (54.3%, n = 25), *Ordered sexual activity* (52.2%, n = 24) and *Vaginal penile* (52.2%, n = 24). Low frequency behaviours included behaviours that were also seen at a low level within the original sample (see behaviours in Table 8.3.1.5 that were all occurring in 2.2%, n = 1).

Behaviours that did not occur in the serial sample were: *Alcohol drank, Allowed to leave, Attracted attention, Blindfolded hand, Boasted, Cared liked loved, Cleaned teeth,*

Commented on own performance, Directed co-offender, Drugs smoked, Gloves, Hair covered, Held hand, Implied knowing, Liar, Locked in, Observed, Phone smashed wires cut, Placed pad, Redressed victim, Requested help, Spat, Switched lights off, Talked to himself, Testicles in mouth, Torch, Weapon from scene.

Behaviours that occurred in a higher percentage in the serial sample were: *Anal penile, Bit, Bound, Breasts, Commented offender sexual arousal, Commented penis, Complimented, Cunnilingus, Ejaculated, Endearment term, Joked or laughed, Kissed, Masturbated hand, Meet up, Multiple victims, No speech, Offered pay, Ordered comment sexual, Ordered comment non sexual, Ordered no report, Ordered sexual activity, Physical violence, Sat or laid beside victim, Scripting verbal, Self-disclosure criminal, Self-disclosure lie, Sexual questions, Slept, Spat hand, Surprise, Taxi called, Threatened weapon, Tobacco smoked, Unconditional threat, Victim arousal, Weapon to scene*.

Behaviours that occurred in a lower percentage in the serial sample were: *Blindfolded material, Confidence approach, Conditional threat, Condom, Control violence, Cuddled, Disguise, Disturbed, Erectile dysfunction, Excused or justified, Fellatio, Foreign language, Multiple acts of violence, Multiple penetrations, Non-alcoholic drank, No hear, Offered assistance, Ordered no look, Ordered no noise, Ordered property, Ordered redress, Ordered undress, Rummaged, Self-disclosure personal, Stole property, Swallowed, Television radio, Threatened physical violence, Tore clothing, Vaginal digital, Vaginal penile, Vaginal washed or cleaned, Verbal abuse*.

The variable *Non sexual questions* was found within the same percentage of cases as the original sample.

8.3.2 Linkage analysis

8.3.2.1 Assessing consistency

8.3.2.1.1 Geo-mobility styles

To examine whether the *Linked pairings* were more similar than the *Unlinked pairings* in terms of the *Geo-mobility styles* exhibited, the percentages of matches for each group was assessed. Table 8.3.2.1.1 shows these.

Table 8.3.2.1.1 Percentage of matches of Linked and Unlinked pairings for Geo-mobility styles

	Percentage of matches		Test output		
	Linked (n = 17)	Unlinked (n = 17)	χ^2	p	ϕ
Geo-mobility	41.2	23.5	1.21	.27	0.19

As Table 8.3.2.1.1 shows, *Linked pairings* had higher number of matches for styles of *Geo-mobility* than the *Unlinked pairings* (41.2%, n = 7 as opposed to 23.5%, n = 4). However, a Chi-Square test for significance (as there no cells with an expected frequency of less than five) did not show a significant difference between the percentage of matches for *Linked pairings* as opposed to *Unlinked pairings* (χ^2 = (1) = 1.21, p = .27). The effect size for this test was calculated using phi, showing a small effect size of 0.19 (Sheskin, 1997).

8.3.2.1.2 Location types

To examine whether the *Linked pairings* were more similar than the *Unlinked pairings* in terms of the types of locations within the offences, the percentages of matches for each group was assessed. Table 8.3.2.1.2 shows these. It should be noted that, as there was such a wide range of types for each of the four location types, these were re-coded to show whether the locations were either *Indoor private*, *Indoor semi-public*, *Indoor public*, *Outside private*, *Outside semi-public*, *Outside public*, or on *Private transport* or *Public transport*.

Table 8.3.2.1.2 Percentage of matches of Linked and Unlinked pairings for Location Type

	Percentage of matches		Test Output		
	Linked (n = 17)	Unlinked (n = 17)	χ^2	p	ϕ
Initial approach location	64.7	41.2			
Attack location	64.7	41.2	1.89	.17	0.24
Crime location	58.8	52.9	0.12	.73	0.06
Victim release Location	58.8	47.1	0.47	.49	0.12

For the *Initial approach location*, the percentage of matches for *Linked* was 64.7% (*n* = 11), whilst for *Unlinked pairs* it was 41.2% (*n* = 7). A Chi-square test was used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* (there were no cells with an expected frequency of less than five). This was not the case (χ^2 = (1) = 1.89, *p* = .30). The effect size for this test was calculated using phi, showing a low effect size of 0.24 (Sheskin, 1997).

For the *Attack location*, the percentage of matches for the *Linked pairings* was also 64.7% (*n* = 11), greater than that of the *Unlinked pairings*, which was 41.2% (*n* = 7). A Chi-square test was used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* (there were no cells with an expected frequency of less than five). This was not the case (χ^2 = (1) = 1.89, *p* = .30). The effect size for this test was calculated using phi, showing a small effect size of 0.24 (Sheskin, 1997).

For the *Crime location*, the percentage of matches for the *Linked pairings* was 58.8% (*n* = 10), greater than that of the *Unlinked pairings*, which was 52.9% (*n* = 9). A Chi-square test was used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* (there were no cells with an expected frequency of less than five). This was not the case (χ^2 = (1) = 0.12, *p* = .73). The effect size for this test was calculated using phi, showing a small effect size of 0.06 (Sheskin, 1997).

For the *Victim release location*, the percentage of matches for the *Linked pairings* was 58.8% (*n* = 10), greater than that of the *Unlinked pairings*, which was 47.1% (*n* = 7). A Chi-square test was used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* (there no cells with an expected frequency of less than five). This was not the case (χ^2 = (1) = 0.47, *p* = 0.49). The effect size for this test was calculated using phi, showing a moderate association of 0.49 (Sheskin, 1997).

8.3.2.1.3 Transportation

To examine whether the *Linked pairings* were more similar than the *Unlinked pairings* in terms of the types of *Transportation* used within the offences, the percentages of matches for each group was assessed. Table 8.3.2.1.3 shows these.

Table 8.3.2.1.3 Percentage of matches of Linked and Unlinked pairings for Transportation used

	Percentage of matches		Test output	
	Linked (n = 17)	Unlinked (n = 17)	Fisher's Exact P	ϕ
Transportation	82.4	88.2	1.00	-.08

For *Transportation*, the percentage of matches for the *Linked pairings* was 82.4% (n = 14), actually lower than that of the *Unlinked pairings*, which was 88.2% (n = 15). A Fisher's Exact test was used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* (the assumption for the Chi-square test was violated as more than 25% of the cells had an expected frequency of less than five). The Fisher's Test showed that this difference was not significant (p = 1.00). The effect size for this test was calculated using phi, showing a small effect size of -0.08 (Sheskin, 1997).

8.3.2.1.4 Inter-Initial approach and Inter-Crime Proximity

To examine whether the *Linked pairings* were closer together in terms of the distance between the *Inter-Initial approach* and *Inter-Crime locations* than the *Unlinked pairings*, the difference in *Inter-Initial approach* and *Inter-Crime distances* between the two groups was assessed.

8.3.2.1.4.1 Inter-Initial approach distances

The distributions of the *Inter-Initial approach distances* for *Linked* and *Unlinked pairings* were examined for normality. This was determined using a Kolmogorov–Smirnov test, a method used in similar studies such as Markson et al (2010) and Woodhams (2008). (Linked Z = 1.44, p < .05; Unlinked Z = 0.76, p = .62). As these results show, the distribution for the *Linked pairings* was significantly different from a normal distribution, whilst the distribution for the *Unlinked pairings* was not significantly different from a normal distribution. As the distances between these two groups are to be compared, both distributions will be treated as non-normal and the appropriate descriptive and inferential statistics are reported. Table 8.3.2.1.4.1 shows the median *Inter- Initial approach* distances for *Linked* and *Unlinked pairings*.

Table 8.3.2.1.4.1 Median Inter- initial approach distances for Linked and Unlinked pairings

	Linked (*n* = 15)		Unlinked (*n* = 15)		Test output		
	Median	Range	Median	Range	*U*	*p*	*r*
Inter-Initial approach distances	0.61	0.08-14.58	15.39	1.58-33.13	-4.26	<.001	0.73

The median *Inter-Initial approach distances* were shorter for the *Linked pairings* (0.61 km) than the *Unlinked pairings* (15.39 km). A Mann Whitney U test was carried out to see if this difference was statistically significant and showed that it was (Z = -4.25, p < .001). Newcombe (2006) explains how to calculate the effect size using a Mann Whitney U z statistic ($r = Z/\sqrt{N}$). This was calculated and showed a moderate effect size (Cohen, 1988) (r = 0.73).

8.3.2.1.4.2 Inter-Crime distances

The distributions of the *Inter-Crime distances* for *Linked* and *Unlinked pairings* were examined for normality. This was determined using a Kolmogorov–Smirnov test, a method used in similar studies such as Markson et al (2010) and Woodhams (2008) (Linked Z = 1.03, p = .25; Unlinked Z = 0.67, p = .77). As these results show, the distributions were not significantly different from a normal distribution. For this reason, appropriate descriptives are reported, alongside correct inferential tests. The mean *Inter-Crime distances* for both groups are shown in Table 8.3.2.1.4.2

Table 8.3.2.1.4.2 Mean Inter- Crime Distances for Linked and Unlinked pairings

	Linked (n = 14)		Unlinked (n = 13)		Test Output		
	Mean	*SD*	Mean	*SD*	*t*-test	*p*	*d*
Inter-Crime distances	3.31	3.54	14.25	10.44	3.70	< .01	1.40

The mean *Inter-Crime distances* were shorter for the *Linked pairings* (M = 3.31 km, SD = 3.54 km) than the *Unlinked pairings* (M = 14.25 km, SD = 10.44 km). An independent samples *t*-test was carried out to see if this difference was statistically significant. After having carried out a Levene's Test for the Equality of Variance, it was discovered that the variances could not be assumed to be homogenous [$F(1, 25) = 16.61$, $p < .00$). Therefore, equal variances were not assumed and the appropriate test output is given. This did show that the difference between the mean *Inter-Crime distances* between the *Linked* and *Unlinked pairings* was statistically significant ($t_{(14.55)} = 3.59$, $p < .01$).The effect size was calculated using Cohen's *d* (Cohen, 1988) and showed a large effect (d = 1.40).

8.3.2.1.5 Offence behaviours

8.3.2.1.5.1 Individual offence behaviours

To examine whether the *Linked pairings* were more similar than the *Unlinked pairings* in terms of the *Individual offence behaviours* exhibited within the offences, the percentages of matches for each group was assessed. Table 8.3.2.1.5.1shows these.

Table 8.3.2.1.5.1 Percentage of matches for linked and unlinked pairings for Individual offence behaviours

	Percentage of matches		Test Output		
	Linked (n = 17)	Unlinked (n = 17)	χ^2	p	ϕ
Control violence	70.6	64.7	0.13	.06	0.71
Vaginal penile	47.1	52.9	0.12	.73	-0.06
Ordered sexual activity	35.3	11.8	2.62	.11	0.28
Physical violence	29.4	23.5		1.00	0.07
Ejaculated	23.5	29.4		1.00	-0.07
Fellatio	23.5	5.9		.66	0.15
Stole property	23.5	11.8		.66	0.15
Kissed	17.6	11.8		1.00	0.00
Weapon to scene	17.6	17.6		1.00	-0.08
Ordered property	17.6	5.9		.60	0.18
Anal penile	11.8	0		.49	0.25
Masturbated hand	11.8	0		.49	0.25
Rummaged	11.8	0		.49	0.25
Self-disclosure personal	11.8	11.8		1.00	0.00
Threatened weapon	11.8	0		.49	0.25
Threatened physical violence	5.9	0		1.00	0.17
Bit	5.9	0		1.00	0.17
Self-disclosure criminal	5.9	0		1.00	0.17
Tobacco smoked	5.9	0		1.00	0.17
Ordered no noise	5.9	0		1.00	0.17
Ordered undress	5.9	0		1.00	0.17
Ordered no report	0	5.9		1.00	-0.17

There were no matches in either the *Linked* or *Unlinked pairings* for the following variables; *Apologised, Blindfolded material, Breasts, Commented offender sexual arousal, Complimented, Condom, Cuddled, Disguise, Erectile dysfunction, Excused or justified, Gagged hand, Non-sexual questions, Ordered no look, Ordered redress, Ordered wait escape, Penis testicles touched forced masturbation, Sat or laid beside victim, Sexual questions, Tore clothing, Vaginal digital, Verbal abuse* and *Victim arousal*. Therefore, these are not tabulated.

As Table 8.3.2.1.5.1 shows, the percentage of matches was higher for *Linked pairings* for the *Individual offence behaviours* of *Anal penile, Bit, Control violence, Fellatio, Kissed, Masturbated hand, Ordered no noise, Ordered property, Ordered sexual activity, Ordered undress, Physical violence, Rummaged, Self-disclosure criminal, Stole property, Threatened physical violence, Threatened weapon* and *Tobacco smoked*.

The percentages of matches were higher for *Unlinked pairings* for the *Individual offence behaviours* for *Ejaculated, Ordered no report* and *Vaginal penile*. The percentages of matches were the same in both *Linked* and *Unlinked pairings* for *Self-Disclosure personal* and *Weapon to scene*.

Chi-square tests were used to determine whether there was a significant difference between the *Linked* and *Unlinked pairings* for *Control violence, Vaginal penile* and *Ordered sexual activity* (there were no cells with an expected frequency of less than five for these variables). These did not show significant differences [*Control violence*, $\chi^2 = (1) = 0.13$, $p = .71$; *Vaginal penile*, $\chi^2 = (1) = 0.12$, $p = .73$; *Ordered sexual activity*, $\chi^2 = (1) = 2.62$, $p = .11$]. The effect sizes were calculated using phi, showing that the test for Control violence had a moderate effect size of 0.71 (Sheskin, 1997).

For the rest of the variables, Fisher's Exact test was conducted as more than 25% of the cells yielded an expected frequency of less than five. As Table 8.3.2.1.5.1 shows, none of these were shown to be significant and phi values showed small effect sizes.

8.3.2.1.5.2 Overall offence behaviour

The distributions of the Jaccard's scores for *Overall offence behaviour* for the *Linked* and *Unlinked matches* were examined for normality. This was determined using a Kolmogorov–Smirnov test (Linked $Z = 1.38$, $p < .05$; Unlinked $Z = 1.16$, $p = .14$). As these results show, the distribution for the *Linked pairings* was significantly different from a normal distribution, whilst the distribution for the *Unlinked pairings* was not significantly different from a normal distribution. As the distances between these two groups are to be

compared, both distributions will be treated as non-normal and the appropriate descriptive and inferential statistics will be reported. Table 8.3.2.1.5.2 shows the median Jaccard's scores for *Overall offence behaviour* for both groups.

Table 8.3.2.1.5.2 Median Jaccard's Scores for the Overall offence behaviour for Linked and Unlinked pairings

	Linked (n = 17)		Unlinked (n = 17)		Test output		
	Median	Range	Median	Range	*U*	*p*	*r*
Overall Jaccard's Scores	1.00	0.00-1.00	0.36	0.10-1.00	-0.64	0.64	-0.11

The median Jaccard's score was greater for the *Linked pairings* (1) than the *Unlinked pairings* (0.36). A Mann Whitney U test was carried out to see if this difference was statistically significant and showed that it was not (Z = -0.64, p = 0.64). Pallant (2007) explains how to calculate the effect size using a Mann Whitney U z statistic ($r = Z/\sqrt{N}$). This was calculated and showed a small effect size (r = -0.11).

8.3.2.1.6 Summary of assessing the consistency

In summary, *Linked pairings* were shown to be more similar than the *Unlinked pairings* only in terms of the *Inter-Initial approach* and *Inter-Crime distances*. This meant that distances within the *Linked pairings* were significantly shorter than those within the *Unlinked pairings*.

8.3.3 Predicting linkage

8.3.3.1 Logistic regression analyses

Various bivariate logistic regressions were subsequently carried out to establish whether any of the aspects were able to accurately predict linkage. This is a method that is commonly used within similar published studies, such as Bennell & Canter, 2002, Bennell & Jones, 2005, Woodhams & Toye, 2005 and Markson et al, 2010).

Before conducting these, the assumptions of logistic regression were checked. Firstly, for each aspect of the offence, the number of cases for each independent variable was examined (see Chapter Two).

The *Geo-mobility* styles could be assessed using logistic regression because the number of 'matches' found within both *Linked* and *Unlinked pairings* was 11. For the *Location* types, the number of matches was as follows; for both *Initial approach location and Attack location,* the number of matches was 18, the number of matches for *Crime location* was 19 and the number of matches for *Victim release location* was 18.

Transportation used could also be considered for logistic regression regarding the cases-to-independent variable assumption; there were 29 matches for this aspect of the offences. This was also the case for *Inter-Initial approach distances* which had 29 cases, *Inter-Crime distances* which had 26 cases and *Overall offence behaviour* which had 23 matches. The only *Individual offence behaviours* that could be used were for the following (the number of matches are shown in parenthesis); *Control violence* (n = 23), and *Vaginal penile* (n = 17).

As the logistic regressions, at this stage, were bivariate, there was no need to test the assumption of multicollinearity. Outliers and influential cases were assessed. Therefore, a baseline model was run for each of the aspects of the offence which includes all cases. Then, all outliers (which were considered those cases were their standard residual was less than 3.0 or more than 3.0) and influential cases (those whose Cook's distance is greater than 1.0) were removed. If the accuracy of the model with these cases removed is greater than the baseline model, the new model will be used to assess the predictive accuracy of the particular aspect.

For most of the variables, there were no influential cases or outliers, and therefore all the cases were considered when running the logistic regression. For *Inter-initial approach* location, there was a case that was both an outlier and an influential case (*ZRE* = 4.51, Cooks = 3.29). When running the logistic regression again after this case was omitted, it was found the model improved in predictive accuracy by 6.4%. Therefore the model without the influential case was used in the analysis, leading to total case size of 28. For the *Inter-crime distances,* no outliers or influential cases were found.

To establish the optimum model for predicting linkage, a forward left-right stepwise logistic regression was considered using all variables. However, as the ratio of variables to the number of observations was higher than 0.25 (there were 12 variables to be considered against 34 observations and therefore the ratio was 0.35), this was not enough to carry out a stepwise regression (Freedman & Pee, 1989, cited within Peduzzi et al., 1996).

The results for the bivariate logistic regressions for each of the 11 aspects are presented in Table 8.3.3.1.

Table 8.3.3.1Logistic regression analyses for each aspect

		β	*SE*	Sig	Model χ^2	Model Sig	R^2	H&L test
Geo-mobility	Matches	0.82	0.76		1.22		0.04	$\chi^2 = (0) = 0$
	Constant	-0.26	0.42					
Transportation	Matches	-0.47	0.99		0.24		0.01	$\chi^2 = (0) = 0$
	Constant	0.41	0.91					
Initial approach location	Matches	0.96	0.71		1.91		0.06	$\chi^2 = (0) = 0$
	Constant	-0.51	0.52					
Attack location	Matches	0.96	0.71		1.91		0.06	$\chi^2 = (0) = 0$
	Constant	-0.51	0.52					
Crime location	Matches	0.24	0.69		0.12		0.00	$\chi^2 = (0) = 0$
	Constant	-0.13	0.52					
Victim release location	Matches	0.47	0.69		0.47		0.01	$\chi^2 = (0) = 0$
	Constant	-0.25	0.50					
Inter-approach distance	Distance	-1.07	0.43	*	29.91	***	0.64	$\chi^2 = (8) = 1.45$, $p = .99$
	Constant	3.80	1.49	*				
Inter-Crime distance	Distance	-0.42	0.18	*	13.23	***	0.39	$\chi^2 = (7) = 2.30$, $p = .94$
	Constant	1.99	0.12	*				
Overall offence behaviour	Jaccard's	5.82	2.79	*	5.14	*	0.14	$\chi^2 = (7) = 2.58$, $p = .92$
	Constant	-2.10	1.06	*				

Note. *$p < .05$; ** $p < .01$; *** $p < .001$

Table 8.3.3.1Logistic regression analyses for each aspect (continued).

		β	*SE*	Sig	Model χ^2	Model Sig	R^2	H&L test
Control violence	Matches	0.27	0.74		0.14		0.00	$\chi^2 = (0) = 0$
	Constant	-0.18	0.61					
Vaginal penile	Matches	-0.24	0.69		0.12		0.00	$\chi^2 = (0) = 0$
	Constant	0.12	0.49					

Note. *$p < .05$; ** $p < .01$; *** $p < .001$

As Table 8.3.3.1 shows, Inter-Initial approach distance, Inter-Crime distance and Overall offence behaviour were a significant fit to the data. The most accurate model was the *Inter-Initial approach distance* model, determined by the high Chi-Square value and the R^2 (Woodhams & Toye, 2007). This model explains 64% of the variance.

The negative beta values for the *Inter-Initial approach* and *Inter-crime distances* show that there are shorter distances between *Linked pairings* than *Unlinked pairings*. This is different for *Overall offence behaviour*, where the beta value is positive; this shows that *Overall offence behaviours* was more similar across *Linked pairings* compared with unlinked pairings.

8.3.3.2 Accuracy of predictions

Table 8.3.3.2 shows how all models improved the accuracy of predictions. Compared with random classification, using the *Inter-Initial approach distance* model to predict accuracy improved the chance of correctly classifying whether an offence was linked or unlinked by 93.1%. The *Inter-Crime distance* model improved accuracy to 74.1%, whilst the *Overall offence behaviour* model improved accuracy to a level of 67.6%. The *Initial approach* and *Attack location* types both improved accuracy to a level of 61.8%. Then, the *Geo-mobility style* improved accuracy to 58.8%. Next, the *Victim release location type* improved accuracy to 55.9%, whilst the *Crime location type*, *Control violence* and *Vaginal penetration* all improved the accuracy to 52.9%. Finally, the *Transportation* models improved accuracy only to 52.0%.

Table 8.3.3.2 Predictive accuracy of the models

Predictive accuracy	Geo-mobility	Transport	IA location	A. location	C. location	VR location	IIA dist.	IC dist.	Beh.	C.violence	Vag.pen
Random	50.0	50.0	50.0	50.0	50.0	50.0	51.7	51.9	50.0	50.0	50.0
Model	58.8	52.0	61.8	61.8	52.9	55.9	93.1	74.1	67.6	52.9	52.9

8.3.3.3 Receiver Operator Characteristics (ROC) analysis

The ability of the 11 models described above that could be used to link crimes was then evaluated using ROC. For each of the 11 aspects, the predicted probability was calculated for each and these were used within the ROC analysis. These are shown in Figure 8.3.3.3.

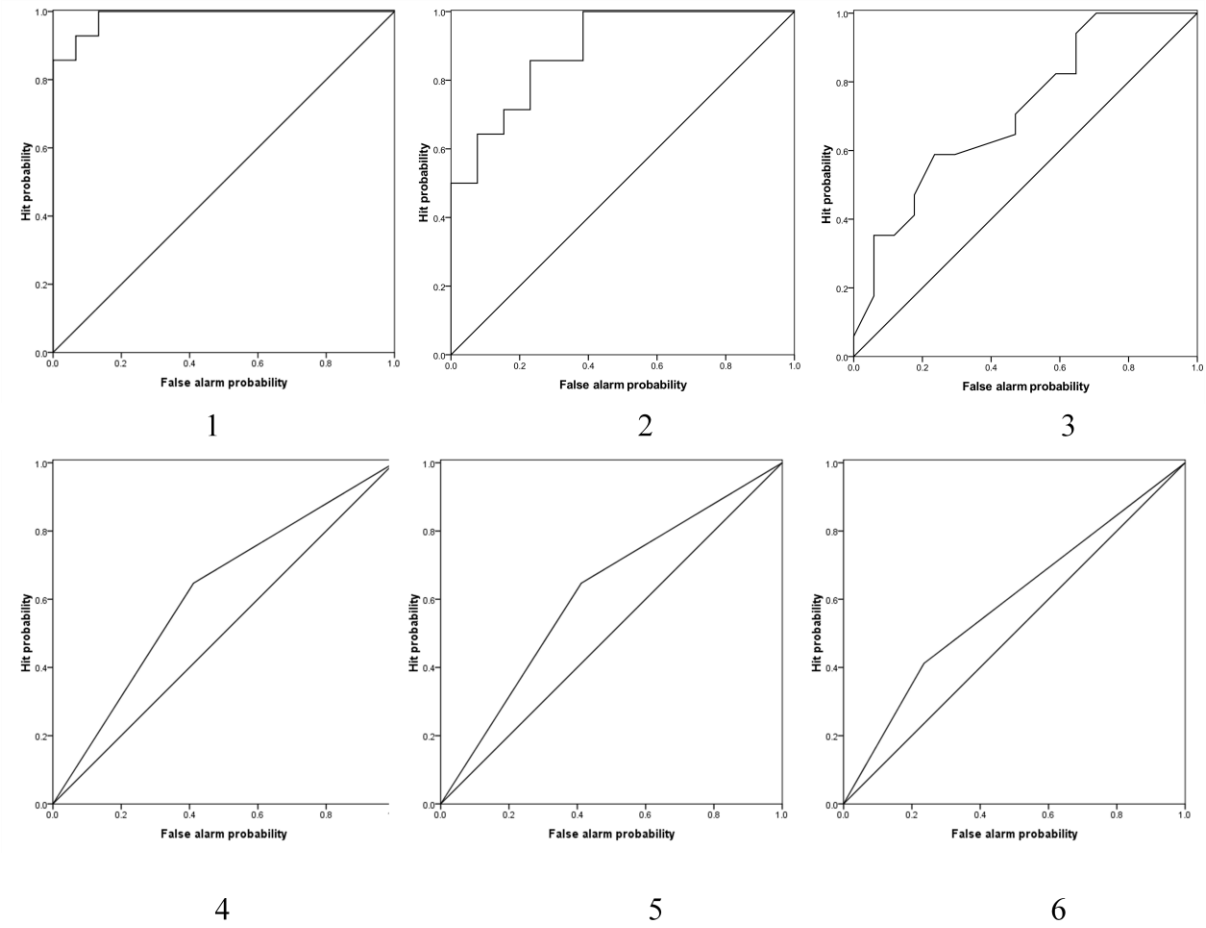


Figure 8.3.3.3 ROC graphs showing AUC for aspect

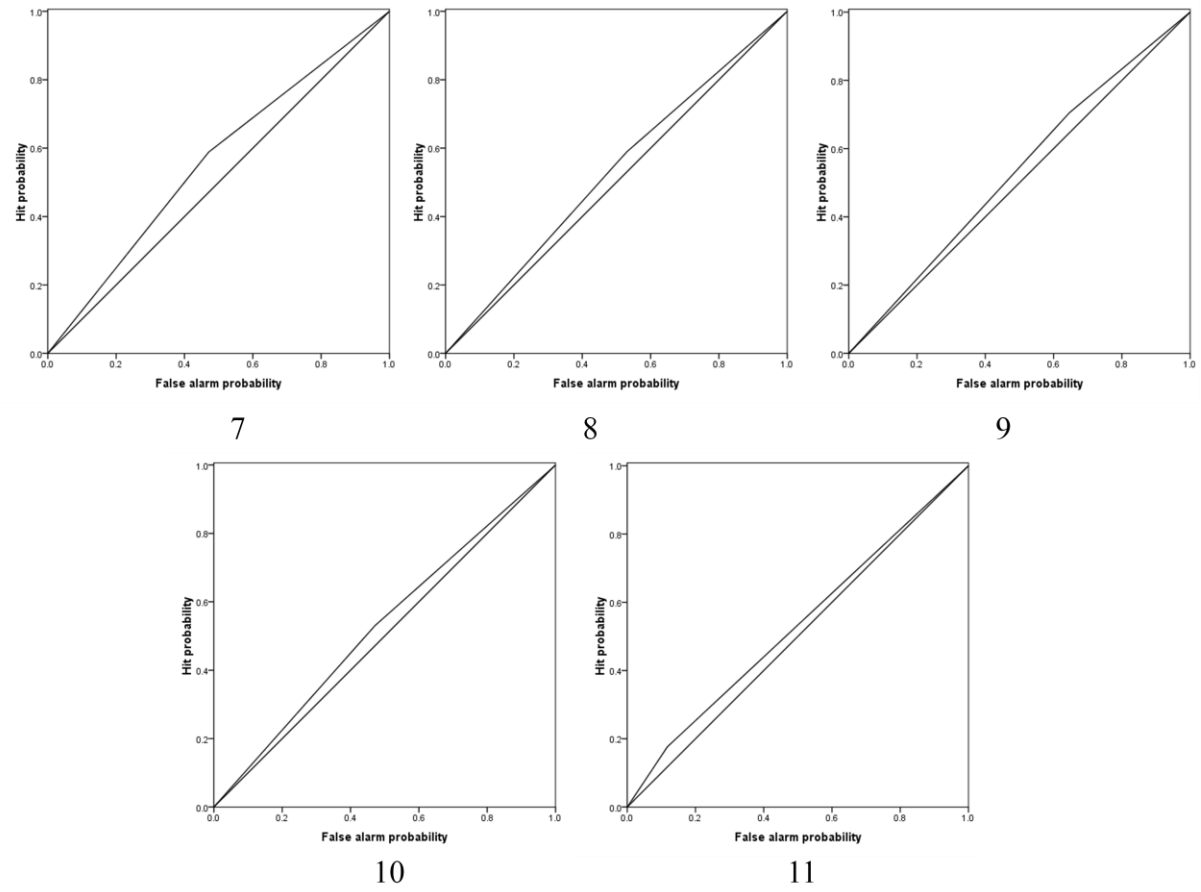


Figure 8.3.3.3 ROC graphs showing AUC for aspect (continued)

Table 8.3.3.3 Area under the curve scores for each aspect

Linked offence	AUC	SE	95% CI
1. Inter-Initial approach distances	0.98***	0.02	0.96 - 1.02
2. Inter-Crime distances	0.89**	0.06	0.77 - 1.01
3. Overall offence behaviour	0.72*	0.09	0.54 – 0.89
4. Initial approach location type	0.62	0.10	0.43 – 0.81
5. Attack location type	0.62	0.10	0.43 – 0.81
6. Geo-mobility	0.59	1.00	0.39 – 0.78
7. Victim release type	0.56	0.10	0.36 - 0.75
8. Crime location type	0.53	0.10	0.33 – 0.73
9. Control violence	0.53	0.10	0.33 – 0.73
10. Vaginal penile	0.53	0.10	0.33 – 0.73
11. Transportation	0.53	0.10	0.33 - 0.73

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

The 'Area under the Curve' is also measured alongside these, giving a value for each of their predictive accuracy. As this shows, the most accurate predictor was seen to be the *Inter-initial approach distance* model; however, *Inter-crime distances* and *Overall offence behaviour* also provided a level of predictive accuracy that was above the acceptable level (Hosmer & Lemeshow, 2000).

8.3.3.4 Optimum decision thresholds

Youden's Index (see Chapter Two), was used to calculate the point at which the most accurate prediction could be made for each aspect that had an acceptable level of predictive accuracy. These were calculated for each aspect and are shown in Table 8.3.3.4.

Table 8.3.3.4 Optimum decision thresholds

Aspect	Optimum decision threshold	p(H)	P(FA)
Optimum model	$p > .53$ (< 3.3 km)	0.93	0.07
Inter-Initial approach distances	$p > .18$ (< 4.96 km)	1.0	0.13
Inter-Crime distances	$p > .57$ (< 6.01 km)	0.86	0.23
Overall offence behaviour	$p > .53$ (Jaccards > .29)	0.59	0.24

This table gives an idea of the "cut-off" point for making decisions about linkage. For example, for inter-approach distances, when the probability (worked out by the logistic regression) is greater than 0.18, the corresponding distance measurement was 4.96 km. Therefore, if two *Initial approach locations* are less than 4.96 km apart, this is the "most accurate" prediction that they are linked.

8.4 Chapter summary

The present chapter aimed to examine whether the *Geo-mobility styles* exhibited by offenders were consistent over a pair of linked offences. It also aimed to establish how accurate the *Geo-mobility styles* were at predicting case linkage. The findings suggest that offenders do not use the same style of spatial behaviour from crime to crime. Moreover, *Inter-Initial approach* and *Inter-Crime distances* were more useful at predicting case linkage than any other aspects of the behaviour.

The *Geo-mobility styles* may not be exhibited consistently across offences for two reasons. Firstly, the dynamic nature of this kind of spatial behaviour indicates that offenders' movement is a fluid action and can be affected by situational influences. The possibility that Ambushed rapes and Followed rapes are similar has been discussed within Chapter Six; perhaps an *Ambushed* offence style would turn into a *Followed* offence style if the place within which the offender first encountered the victim was not suitable. Secondly, as the sample size within this serial sub-sample was small, it was not possible to establish within-*Geo-mobility style* consistency; some styles may be more robust to situational influences than others. For example, within the *Intruded style*, the target is, in effect, the house (or place of work) of the victim. The victim's escape possibilities are limited and there is a smaller possibility that the offence will be interrupted (Warr, 1988). Therefore, this *Geo-mobility*

style may be more consistent than others, particularly because the behaviours often exhibited within it are often those associated with a more 'instrumental' aspect of criminality.

Although consistency of the *Geo-mobility styles* was not established, this chapter found that *Inter-Initial approach proximity* and *Inter-Crime proximity* were accurate predictors of case linkage. The latter finding echoes that of many studies such as Bennell and Canter (2002), Bennell and Jones (2005), Grubin et al., (2001), Markson et al., (2010) and Tonkin et al., (2008). The former measure has not been considered within rape linkage research before and shows a greater predictive accuracy than Inter-crime distances. This may mean, therefore, that the location where the offender met the victim may have more significance than the place where he attacked, raped and released her (if there was movement). This supports the idea that the choice of initial approach location may be more in the control of the offender than other behaviours shown (C/F Bennell & Jones, 2005). Such findings also support research which shows how offenders will not often travel far to commit crime (for example, Rhodes & Conly, 1981) and theories that suggest that offenders may do this because they are more familiar with the environments within which they live and work (C/F Routine Activity Theory, Crime Pattern Theory) and that there may be 'costs' involved in travelling further afield (C/F Rational Choice Theory).

The role 'distinctiveness' plays in the linking process may explain why the Geo-mobility styles were not useful in linking offences together. As explained within Chapter One, offenders need to behave differently (at some level) to each other, in order to be effectively discriminated from other offenders. If all offenders behaved in the same manner, then it would be difficult to separate one offender's actions from another. Because of the small sample size used within this chapter (as discussed below), it could have been that there was not enough scope for a wide range of Geo-mobility styles to be exhibited. Thus, it could have been impossible to differentiate between the styles of linked and unlinked pairings. This could be the reason why the Geo-mobility styles performed weakly in the prediction task.

The results of this chapter also indicate that overall offence behaviour can be used to predict that two crimes have been committed by the same offender. The AUC value found here was 0.72 which is similar to that found within the Bennell et al., (2009) study. As Swets (1988) points out, this value indicates that this is a 'good' level of predictive accuracy. In past research (and using different crime types) authors have shown that some behavioural domains do not necessarily provide an accurate way of predicting case linkage (for example, Bennell & Canter, 2002). Overall offence behaviour may be a more 'useful' aspect to study in rape behaviour, perhaps because of the inter-personal nature of the offence (and therefore, more

detailed verbal and non-verbal information that can be recorded). Also, by taking an overall measure of offence behaviour, rather than examining themes, domains or individual behaviour, this may reduce the impact that situation may have on specific behaviours. The present chapter has implications for case linkage. It could be argued that there should be more reliance on examining the behaviours exhibited at the beginning of the offence, such as initial approach location than those after the victim and the offender have met. Therefore, this would minimise the influence the situation has on the behaviour exhibited. This chapter also highlights the importance of recording the exact location of the initial approach. As noted in Chapter Two, this is not always recorded and is not geo-coded. Knowing this information could have important ramifications for intelligence gathering and case linkage.

Another important implication of the findings of this chapter is that overall offence behaviour can, reasonably accurately, be used to predict whether offences are linked together. Therefore, in the investigative tool of Comparative Case Analysis, crime analysts could examine the offence behaviour of two offences and, using a measure of similarity such as Jaccards, be able to make an informed decision as to whether the offences were linked. As argued within Chapter One, this task is carried out within police forces every day. However, having an indication of the level of similarity that would be necessary for a 'correct' decision, may allow crime analysts to carry out CCA in a more focused manner.

There are several limitations to this chapter. Firstly, the size of the sample used within this chapter is small. It is therefore impossible to establish whether the offence behaviours could be differentiated into themes (as in Chapter Five). Canter (2000) argues that consistency may be more readily established at a thematic level rather than an individual offence behaviour level because of the impact that the situation may have on specific behaviours. The variables were not classified using the themes defined in Chapter Five, as some authors have found that the behavioural structure of serial rape may be different from that of one-off offenders (for example, Santtila et al., 2005).

Another limitation of this chapter, and related to the small sample size, is that the sample used to derive the *Unlinked pairings* was the same sample from which the *Linked pairings* were derived. Researchers such as Woodhams (2008) have found that using this method inflates the performance of inter-crime distances, especially when using a large geographical area. Thus, as rapes occurred across London (which is the UK's biggest city), the predictive ability of both the *Inter-Initial approach* and *Inter-Crime distances* were no doubt overstated. Future research would need to consider whether these measures were as useful over a smaller geographical area. Encouragingly however, this chapter has found that

overall offence behaviour can also be used to accurately link crimes together and this result does not suffer from the methodological limitation that occurs from using inter-initial approach and inter-crime distances.

Lastly, a limitation for the whole thesis is that the offences used were those that had already been detected. Therefore, these offences may have been solved because of their closeness in proximity. It could be that offences that remain undetected are those within which the offender chooses to commit offences across a wider geographic area.

CHAPTER NINE
DISCUSSION

9.1 Summary of main findings

The present thesis aimed to explore the spatial behaviour of stranger rapists within the rape event. This was to enable a closer examination of how contextual factors could be related to other offence behaviours. The thesis also aimed to examine how useful knowledge of such spatial behaviour was in aiding the tasks of 'offender profiling' and case linkage.

The findings from the thesis showed that the spatial behaviour could be differentiated into four main *Geo-mobility styles*, with those who *Intruded, Ambushed, Abducted* or *Followed* their victims. These *Geo-mobility styles* were related to behavioural themes; *Intruded* was related to offence behaviours with a broad *Criminal* theme, *Ambushed* and *Followed* styles were related to offence behaviours indicative of a *Violent* theme, whilst *Abducted* styles were shown to be associated with *Sexual* offence behaviours.

An examination of how useful these *Geo-mobility styles* could be at predicting offender background characteristics found that there was no association between the type of style exhibited by offenders and their background characteristics. Moreover, there were only two significant associations between other individual behaviours and offender characteristics. Tests to examine how accurate these behaviours were at predicting age and the spatial behaviour within past offences showed limited predictive accuracy.

An examination of how useful these *Geo-mobility styles* were at predicting whether two offences could be linked showed that the styles were not consistently exhibited across crimes. However, it was found that *Inter-Initial approach distances, Inter-Crime distances* and overall offence behaviour were shown to be consistent across linked crime pairs and to a significant level of accuracy.

9.2 Chapter summaries and comparisons with past research

Chapter Three provided a picture of the nature of detected stranger rape in London from 1st May 2004 and 31st December 2006, using 112 offences. An examination of the timing of offences, the characteristics of both victims and offenders generally provided support for previous descriptive studies examining similar elements. Rapes usually occurred in the night time at weekends (similar to Feist et al., 2007 and Ruperal, 2004). Both victims and offenders were usually under 30 (for example, Amir, 1971 and Ruperal, 2004) and there was an over-representation of Afro-Caribbean victims and offenders within the sample (as seen by Ruperal, 2004 and Smith, 1989). Distances between the offenders' home base and the

initial approach or crime locations were usually less than 3 km, findings which support numerous research studies on 'journey to crime' such as Canter and Larkin (1993). Offenders usually had a previous offence, usually for a violent offence, recorded on the Metropolitan Police Service's Crime Recording System, which supports research indicating that rapists' usually have a past offending history and that this history usually contains violence, with little emphasis on previous sexual convictions (for example, Soothill et al., 2002). An examination of past spatial behaviour indicated that the offenders did not travel far to commit previous offences and that journey to crime for property offences was generally shorter than that for crimes against people (which supports studies such as Rhodes and Conly, 1981). The crime locations of previous offences were also found to be more widely dispersed in space for person-centred crimes (such as violence or sex offending) than the crime locations of property-centred offences (such as burglary). This supports the work of Goodwill and Alison (2005) who concluded that this may be due to the ability of targets within the former types of crime (that is, people) being able to move around as opposed to the targets of property offences which are static (for example, houses) and tend to be located in clusters.

Chapter Four offered a descriptive analysis as well as providing a thematic analysis of the offenders' spatial behaviour *within* the offences. There was a higher concentration of offences within the centre of London, with a more dispersed spread of offences as the distance from the centre decreased. This supports research which relates how crime, in general, is usually concentrated within the older cities' Central Business District (for example, Boggs, 1965) and also supports more recent work, specifically examining rape within the MPS region (Ruperal, 2004). Usually offences occurred within one or two locations, supporting the work of Beauregard et al., (2007b) who found that, usually, offenders do not travel far *within* their offences. The majority of offenders travelled on foot, a finding supporting those from Snook (2004) who examined the transportation styles of robbers. The offenders usually approached and attacked the victim in an outdoor public location, notably the street. Other studies examining types of locations have also noted that stranger rapists will usually encounter their victims on the street (for example, Ruperal, 2004) and this can be explained by Routine Activity Theory (Cohen & Felson, 1979). The type of location of the crime and victim release locations was found to be different however. In most cases, the offender raped and released the victim in her own house, a result also found within Jones et al., (2004). Offenders may do so because such a location may provide an opportunity for the offender to complete the rape without the risk of being interrupted (Warr, 1988).

The thematic analysis drew out four *Geo-mobility styles*. These provided a 'story' of the rape event itself, emphasising the way in which the offenders moved within their offences. Those who used the *Intruded* style approached, attacked, committed the offence and released the victims in the same indoor private location. Those who *Ambushed* their victims approached, attacked, committed the offence and released the victims in the same outdoor public or indoor semi-public locations. The offender did not move the victim to another location, or there was movement from the Crime location to the Victim release location. Those who *Abducted* their victims used more than one location within their offence and the movement from one location to another involved the offender using force or the threat of force. The Initial approach location was an indoor semi-public location, an outdoor public location, or on public transport. The Attack location was either an indoor semi-public or an outdoor public location. The Crime location was an indoor private, indoor semi-public, outdoor semi-public, outdoor public location or in private transport. Those who *Followed* their victims approached their victims in a different location to where they attacked them. Their movement between these two locations did not involve force and the subsequent attack, crime and victim release locations were all the same. The Initial approach location was either an indoor semi-public location, an outdoor public location or on public transport.

The *Geo-mobility styles* showed a dynamic picture of the offenders' spatial behaviour from the victims' statements. The *Intruded* style was similar to that found by Warr (1988) and Beauregard et al., (2007b) who examined and found a 'home intrusion' style rape within the offences examined. Reasons for the exhibition of this style may be that the offender chose such a location because of the seclusion it offered (Beauregard et al., 2007b) and the potential 'attractiveness' or 'rewards' particular types offered (for example, a female living on her own) (Warr, 1988). The *Ambushed* style was similar to Rossmo's (1997) Raptor approach as well as Beauregard et al., (2007b)'s Direct Action rape track. Offenders may use this approach as they are already located within areas which offer seclusion and isolation (such as parks or commons) and therefore, take the opportunity to attack their victims (C/F Beauregard et al., 2007a's interview studies with serial rapists). The Abducted style was similar to LeBeau (1987b)'s 'kidnap style attack and Beauregard et al., (2007b)'s Outdoor rape tracks, although these tracks offered different 'combinations' of types of initial approach, attack, crime and victim release location. Reasons for the *Abducted* style could be to do with the location of the initial approach; Beauregard et al., (2007a) found that offenders moved their victims because the area within which they initially encountered them was busy or less secluded than the crime location. Lastly, the *Followed* style bears resonance to

Rossmo's Stalker method of approach, where the offender followed his victim until there was an opportunity to attack her. It could be argued that the offenders followed their victims because the initial approach location was one that is too busy. The offenders therefore, waited until the victim got to a more isolated location to commit the offence (C/F Beauregard et al., 200a).

Chapter Five examined the offence behaviours within the rapes. This was carried out to establish whether these could be differentiated into themes. Using Smallest Space Analysis, the results showed that the offence behaviours could be split into the themes of *Criminal, Violent* and *Sexual*. These themes are repeatedly found within studies of rape behaviours. The *Criminal* theme was exemplified by control and theft behaviours such as stealing, rummaging for items to steal, ordering the victim to give him property to steal, use of a weapon as well as showing a level of forensic awareness and 'safety' procedures, such as the use of a condom, wearing a disguise, locking the victim in, and ordering the victim to wait in particular place until he had safely escaped. Other authors have also found such a theme within similar studies; for example, Canter and Heritage (1990)'s Criminality theme, Davies (1992)'s Modus Operandi aspect, Alison and Stein (2001)'s Dominance theme, Canter et al., (2003)'s Theft and Control themes and Häkkänen et al. (2004)'s Theft theme. Such a theme bears resemblance to those found in motivational classification systems such as Groth (1969), who postulated that rape was motivated by a will to exert power over victims and also to ideas that offenders rape as an extension to their overall criminality and that they are often motivated by instrumental rather than expressive goals (for example, Bartol, 1986).

The *Sexual* theme included behaviours may be indicative of pseudo-intimacy and sexual gratification. Such actions included asking the victim sexual and non-sexual questions, apologising for and excusing his actions, cuddling the victim, as well as ordering her to undress and redress, ordering sexual activities, digital vaginal penetration, sucking or licking the victim's breasts and ejaculating. Similar themes have been found in previous research; for example, Canter and Heritage (1990)'s Sexuality and Intimacy themes, Davies (1992)'s Sexual and Personal gratification as well as Attitude and Intimacy aspects of the offence, Canter et al., (2003)'s and Häkkänen et al. (2004)'s Involvement themes. Such behaviours are resonant of past theories that suggest that some offenders rape due to a need for intimacy (Marshall, 1989) or a need to satisfy sexual urges (for example, Cohen et al., 1969).

The *Violent* theme was exemplified by behaviours that were related to aggressive and hostile acts. Such actions included physical violence (such as punching and kicking), tearing the victim's clothes and biting her. Other researchers have found similar themes within rape;

for example, Canter and Heritage (1990)'s Violence and Impersonal themes, parts of Davies (1992)'s Sexual and Personal gratification theme and Alison and Stein (2001)'s, Canter et al., (2003)'s, and Häkkänen et al. (2004)'s Hostility regions. Past theory has often recognised that rape can be thought of as a violent act; early motivational theories emphasised that the alleviation of aggression may be a focal drive behind rape offences (Cohen et al., 1969; Groth, 1979), whilst general theories of crime, in general, emphasise how acts can be expressively violent (Feshbach, 1964; Bartol, 1986, from Canter et al., 2003).

Chapter Six examined the relationship between the *Geo-mobility styles* and the offence behaviours exhibited. This was carried out to explore how context and behaviour may be associated. The relationship between the *Geo-mobility styles* and *Individual offence behaviours* was first examined, finding that there were few associations between individual offence behaviours and the types of spatial mobility displayed within the offence. As Canter (2000) argues, a heavy reliance of the importance of individual offence behaviours may prove to be unreliable (due to recording or situational influence) but that, by examining behaviours as themes, this might better indicate offence style. Thus, Chapter Six considered how the *Geo-mobility styles* were related to the behavioural themes established in Chapter Five.

Results showed that the *Geo-mobility style Intruded* was related to the broad Criminal behavioural theme. Thus offenders who broke into the victim's house or work and raped her there, showed behaviours that could be indicative of general criminal awareness and the need to control. Past research has found that the opportunity structure of such 'home-intrusion' style rapes is similar to that of burglary (for example, Warr, 1988) and some have acknowledged that some offenders may rape as an extension of their criminality or instrumental motivations (for example, Scully & Marolla, 1985). Contextual factors may also affect the exhibition of such behaviours as locking, blindfolding or using a weapon from the scene; the materials found within a house may allow for the offenders to act in these ways.

The *Ambushed* and *Followed* themes were both related to the *Violent* behavioural style. Thus offenders who initially approached, attacked, raped and released the victim in the same location (usually an outdoor public place), and those who followed their victims, without force, (usually from a busier location to a more secluded place), who then attacked, raped and released the victims in the same place, both exhibited broad violently violent behaviours. Past research has indicated that offenders, who have been more intent to injure their victims, commit the offence in more isolated areas (Fisher, 1980). Theories that seek to explain violent behaviour within rapes do so by claiming that some offenders act this way in order to express particular hostility towards the victim (for example, Cohen et al., 1969).

Other explanations for the exhibition of these behaviours could include the idea that the offender would need to use excessive force to overpower the victim in these cases. As the location of these offences was usually in an outdoor public place, the chance that someone would hear the victim would be increased. Thus, the offender may have needed to subjugate her quickly.

Finally, the *Abducted* style was related to the *Sexual* behavioural theme. Thus, those who forcibly took the victim from one location to another, exhibited behaviours that may indicate the need for intimacy (Marshall, 1989) or for the satisfaction of sexual urges (for example, Cohen et al., 1969). Contextual influences on offence behaviour could also explain this relationship; being within the suspect's house would allow him to have more time and more privacy to behave in an intimate way towards the victim or to carry out particular sexual activities. Equally, verbal threat strategies may have been used in order to force the victim from one place to another.

Chapter Seven examined whether the *Geo-mobility styles* could be associated with particular offender characteristics and, if so, how accurate the styles were when predicting these characteristics in comparison to individual spatial and offence behaviours. This chapter used a similar methodology to Goodwill et al., (2009) who examined the comparative accuracy of four models of rape behaviour (namely, the Massachusetts Treatment Centre's classification system, Knight, 1999; the Power and Anger model, Hazelwood, 1987; Canter et al., 2003 model of rape behaviour; a multivariate model based on all individual offence behaviours). It was found that the styles were not significantly associated with any offender characteristics and that only a small number of offence behaviours were significantly associated with specific offender characteristics. Further, using logistic regression, it was found that predicting whether the offender was of an age more than 23 from whether they had used a condom or had disclosed information about their past criminal behaviour and predicting whether the offenders' mean inter-point distances were more than 4.40 km was more effective than chance. However, the adoption of Receiver Operator Characteristics analysis showed that predictive accuracy was not to an acceptable standard (as advised in Hosmer & Lemeshow, 2000).

Chapter Eight examined whether the *Geo-mobility styles* exhibited by offenders were consistent over a pair of linked offences. It also aimed to establish how accurate the *Geo-mobility styles* were at predicting case linkage. The findings suggest that offenders do not use the same style of spatial behaviour from crime to crime. Moreover, *Inter-Initial approach* and

Inter-Crime distances were more useful at predicting case linkage than any other aspects of the behaviour.

The *Geo-mobility styles* may not be exhibited consistently across offences for two reasons. Firstly, the dynamic nature of this kind of spatial behaviour indicates that offenders' movement is a fluid action and can be affected by situational influences. The possibility that *Ambushed* rapes and *Followed* rapes are similar has been discussed within Chapter Six; perhaps an *Ambushed* offence style would turn into a *Followed* offence style is the place within which he first encountered the victim was not suitable. Secondly, as the sample size within this serial sub-sample was small, it was not possible to establish within-*Geo-mobility style* consistency; some styles may be more robust to situational influences than others. For example, within the *Intruded style*, the target is, in effect, the house (or place of work) of the victim. The victim's escape possibilities are limited and there is a smaller possibility that the offence will be interrupted (Warr, 1988). Therefore, this *Geo-mobility style* may be more consistent than others, particularly because the behaviours often exhibited within it are often those associated with a more 'instrumental' aspect of criminality.

Although consistency of the *Geo-mobility styles* was not established and inter-offender variation could not be examined (due to the small sample size), this chapter found that *Inter-Initial approach proximity* and *Inter-Crime proximity* were accurate predictors of case linkage. The latter finding echoes that of many studies such as Bennell and Canter (2002), Bennell and Jones (2005), Grubin et al., (2001), Markson et al., (2010) and Tonkin et al., (2008). The former measure has not been considered within rape linkage research before and shows a greater predictive accuracy than *Inter-crime distances*. This may mean, therefore, that the location where the offender met the victim may have more significance than the place where he attacked, raped and released her (if there was movement). This supports the idea that the choice of initial approach location may be more in the control of the offender than other behaviours shown (C/F Bennell & Jones, 2005). Such findings also support research shows how offenders will not often travel far to commit crime (for example, Rhodes & Conly, 1981) and theories that suggest that offenders may do this because they are more familiar with the environments within which they live and work (C/F Routine Activity Theory, Crime Pattern Theory) and that there may be 'costs' involved in travelling further afield (C/F Rational Choice Theory). Chapter Eight also found that overall offence behaviour was a good predictor of case linkage, a finding that echoed a recent paper by Bennell et al., (2009) and also by Yokota et al., (2007). It could be argued that this was the case because overall offence behaviour is less likely to be impacted by situational factors and has useful

implications for Comparative Case Analysis, Namely, the use of the AUC statistic gives crime analyst a more focused criteria with which to make ‘more’ accurate decisions.

9.3 Theoretical implications

9.3.1 The dynamic nature of the rape event

The present thesis emphasises that rape is a dynamic event and that offence behaviour can be influenced by environmental and other contextual factors. Theories from personality psychology help us to understand this; contemporary theorists such as Magnusson and Endler (1977) posit that the exhibition of behaviour is can be influenced by the situation within which it occurs. Cognitive affective personality systems (CAPS) (Mischel & Shoda, 1995) ensure that individuals respond to psychologically similar situations in particular ways, and that these responses can be very different. In terms of the present study, the difference between the broad behavioural themes exhibited for the different *Geo-mobility styles* highlights how context (types of location and movement of the offenders) can be used to differentiate between styles of offending. For a (potentially) a variety of different reasons, the styles of offending behaviours are different depending on whether the offender broke into the victim’s house, they approached, attacked and raped the victim in the same location, they forced her to another location or if they followed the victim to the rape site. These findings can be used to bring forward traditional theories of why offenders exhibit particular behaviours, rather than relying on motivational ideas.

9.3.2 Consistency, inter-offender variation, homology

Chapter One examined how the assumptions of consistency, inter-offender variation and homology were underlying principles of offender profiling and case linkage (for example, Mokros & Alison, 2002). The present thesis was unable to provide empirical support for homology, both in terms of the *Geo-mobility styles* exhibited and other variables. Therefore, offenders who behaved in the same manner, be that spatially or behaviourally, did not share the same background characteristics. Although it could be that the methods used within this thesis to examine this may have had their limitations (i.e. the number of tests, using individual offence behaviours), that such a detailed examination failed to provide support for an association between actions and characteristics does call into question the ability of using actions shown in the crime as a way of prioritising suspects in a rape investigation. As discussed in Chapter Seven and supporting the ideas of Goodwill and Alison (2007), however, there is now a need to examine which pairs or combinations of

variables may be more useful at predicting particular characteristics. It could also be that particular *Geo-mobility styles* may be more useful than others; future research could examine larger samples to study particular styles such as the *Intruded* rapes. Lastly, in terms of predicting the offender characteristics, the present thesis provides support for the notion that many rapists are versatile offenders (see Simon, 1997 for a review). The range of offences the offenders had within their offence background, the difficulty in establishing homology and the small serial sub-sample size (drawn from offenders in the original sample) all indicate that these offenders did not have particularly 'sexual' offence histories and did not particularly solely attack strangers.

In terms of consistency and inter-offender variation, it was found that the *Geo-mobility styles* were not displayed consistently from one offence to another and that they were not useful in distinguishing between offenders. Therefore, although knowledge of how the offender moved within the offence may be useful in terms of explaining the offence behaviour exhibited, this kind of information may not be useful for pragmatic tasks such as case linkage. Referring back to personality theory, the offenders may have found the particular situations within which they carried out their two rapes psychologically different. Therefore, they did not behave in the same way across the offences. This provides support for the idea that offence behaviours may not be particularly for linking rapes together as they are too dependent on victim reaction or other situational influences (C/F Funder & Colvin, 1991). The present author argued that the *Geo-mobility styles* may have been more useful than the offence behaviours because the formulation of these styles was partly based on the knowledge of the type of location within which the offender approached his victim. This was not the case. However, because of the small sample size of the serial sub-sample, this needs to be investigated further. It could be that particular *Geo-mobility styles* are more consistent than others; this was not able to be investigated within the current study.

Distance measures, however, were found to be both consistent, showed inter-offender variation and were accurate predictors of case linkage. Therefore, offenders were going back to areas within which they had already targeted and committing another offence. This emphasises the importance of examining the spatial behaviour of offenders and supports ideas and research that considers that offenders usually do not travel very far to commit offences and that, perhaps, they are guided by their routine activities, rational choices, and mental maps of the particular areas. Skinnerian principles could also be applied; it could be that offenders are finding that they are 'successful' in particular area and are therefore

rewarded, which means that they are more likely to go back to the area within which they were rewarded.

This finding has important ramifications for the practical task of case linkage. Firstly, the use of optimum decision thresholds that indicate the point at which one can predict linkage (where there is the highest probability of a 'hit' but the lowest probability of a 'false alarm') give investigators a tangible measurement to use. Secondly, just the knowledge that serial offender will commit subsequent offences near to where they have approached or attacked their victims before, can allow analysts to unsolved crimes for the likelihood of being a common, unknown offender. Lastly, if an offender is known, practitioners can start to look within the surrounding areas at other stranger rapes that may be linked to him.

9.4 Other implications

9.4.1 Police recording practices

A number of suggestions can be made about the police recording of stranger rapes. Firstly, a tighter definition of Stranger 1 and Stranger 2 needs to be considered; the present author found that a higher proportion of the offences recorded were not such offences and that victims raped by casual acquaintances, friends, intimates and family members were recorded as stranger offences. Thus, this is giving a false impression about the number of stranger rapes recorded by the MPS each year.

The importance of ascertaining the initial approach location within rapes has been highlighted throughout this thesis. As Van der Kemp and van Koppen (2007) insist, the location where the offender first met the victim should be considered when measuring journey to crime distances. They state that the attack location is often "more determined by the travel direction of the victim and suitable places to rape her along the route" (p359). This is particularly pertinent in *Followed* offences. Therefore, is suggested that the precise location of the initial approach should be identified by the police, as well as the attack location. The present author used Google Streetview © as a useful tool to identify approach locations; perhaps this could be used to aid victims' memory in interview.

The identification of offenders from their name and date of birth was a difficult process. Thus it is suggested that there could be some way of giving offenders a unique identifier. That way, cross-borough intelligence could be shared more readily.

The offenders' base must be recorded as accurately as possible. Offenders often lead transient lifestyles and the problem of identifying where they were living at the time of the offence is acknowledged as being difficult. However, as much as possible, other residences or

places of interest could be included on CRIS. One offenders' address was over 500 miles away; however, on deeper investigation of the CRIS records, it was found that he also had connections and an old address in London.

9.4.2 Proactive interventions

A number of proactive interventions could be used to prevent stranger rapes. For example, in the case of *Ambushed* offences, 'target hardening' could be used within particular parks or places where these offences occur. Some boroughs already have initiatives to "restrict opportunities to indulge in anti social behaviour" (Havering Community Safety Partnership, 2003, p.16) in the borough's parks and commons. Perhaps there is also a need to provide emergency call boxes in areas particularly associated with the *Ambush* style of offences.

Strategies for community education could also be developed, taking into consideration the initial and attack locations within the rapes with the travel patterns and potential decisions made within the offences. The initial and attack location type solely within stranger rape situations (where there was no prior contact before the offence) has not been studied in such detail before, at such a localised level. Thus, educating potential victims about the danger of walking outside at night, especially in isolated is considered important.

A proportion of the stranger rape offences occur within the home, with the offender breaking into the victim's house and raping her inside. As Beauregard et al., (2007b) suggest "Sexual assault investigators should inform women that some sex offenders are "environmentally aware" and will be attracted by any cues on the outside of a building that give away the identity of its occupants" (p.1082).

The finding that serial stranger rapists will often return to areas where they have approached or attacked victims before has implications for crime prevention. Therefore, if an offence has occurred in a particular location, surveillance teams or extra police patrols could be allocated to that location after the offence with the aim of apprehending the offender. However, as serial stranger rape offences are particularly uncommon and that the mean time between offences in the linked sample was 465 days, this may not be especially feasible. Instead perhaps, raising public awareness that an incident has occurred may prevent further instances.

9.4.3 Clinical management of offenders

Even though spatial behaviours were more accurate in linking offences, the predictive accuracy of overall offence behaviour was still quite high. This suggests some level of stability of behaviour in serial stranger rapes, perhaps at a thematic level. Such consistency or 'stability' of offence behaviours is an assumption used in the treatment of sex offenders (Sjöstedt, Långström, Sturidsson & Grann, 2004). Thus, identifying the particular themes of behaviour consistently used by rapists might have implications for clinical treatment programmes.

9.4.4 Risk assessment

The last practical implication is the assessment of risk in cases where the police want to assess the 'dangerousness' of a particular offender. *Ambush* rapes are particularly violent and are committed by offenders who have prolific violence in their background; thus, these offenders may be of a greater threat of further violence. Indeed, as Warren et al., (1999) found serial rapists who used greater levels of verbal violence within their attacks were more likely to escalate their levels of violence in subsequent attacks. However, recent research carried out in the USA has found that serial offenders tend to use more criminally sophisticated behaviours (such as being forensically aware) compared to single offenders who used more violent and interpersonal behaviours (Park, Schlesinger, Pinizzotto, & Davis, 2008), perhaps suggesting that *Ambushed* offenders may be 'one-off' offenders. Further research would be needed to determine whether offenders within a particular type of geo-mobility (if any) go on to be serial offenders and whether the level of violence shown increased, decreased or did not change.

9.5 Limitations and improvements

Throughout the thesis, within the chapter summaries, the limitations of the methods used have been considered. This section presents some that are particularly important to consider when applying the findings of this thesis.

9.5.1 Examining offence behaviours and offender characteristics using bivariate correlations

The logistic regression models used in Chapter Seven used single behaviours to predict single characteristics. This method assumes that any relationships found are independent from situational influences or other variables, which is not (always) the case (as

seen in Goodwill & Alison, 2005). Thus, others have used full logistic models to try to examine which offence variables are still predictive even with the impact of other variables (Goodwill, Alison, & Beech, 2009). However, using such a method could violate one of the main assumptions of logistic regression; if variables are too highly correlated, then they could cause the problem of multicollinearity (Tabachnick & Fidell, 1996). The large standard errors cited within some of the multivariate models within Goodwill et al., (2009) may have been caused as a result of this. Equally, independent variables at the end of a list of inputted variables will 'drop out' of full model regression analysis. Thus, although the present author accepts the theoretical limitation of using bivariate correlations, it was thought that this would be more statistically viable. Future research could explore any particular combinations of geo-mobility and behaviour and their use in predicting particular background characteristics, similar to Goodwill and Alison (2005).

9.5.2 The effect of alcohol and drugs

The impact of other influences on spatial and offence behaviour (and hence operant and aggressive actions) was not considered within this study. For example, extraneous variables such as alcohol and drug use were not considered. These could play a part in the behaviour of the offender *and* the victim. For offenders, disinhibition theory states that parts of the brain responsible for regulating impulsive behaviour are impaired by alcohol consumption and, thus its' imbibment may increase such behaviours, including aggression (Gustafson, 1994). Roizen (1997) found that 60% of sex offenders were drinking at the time of the assault. Indeed within the present study, some victims reported that they could smell alcohol on the breath of the offenders; equally, other victims reported that the offender appeared to be on drugs. Also, if the victim has been drinking this may have an effect on offender behaviour; if the victim is intoxicated, they may not be able to resist physically. Therefore, the moderating effect of alcohol and drugs on the geo-mobility and offence behaviour of stranger rapists warrants further study.

9.5.3 Topographical features of the environment

The environmental layout of the areas involved was also not considered. It has been suggested that the topographical features may have some influence on the spatial behaviour of offenders and must be considered in operational processes such as geographical profiling At a general level, it has been found that offenders who commit their crimes within urban environments will make significantly shorter crime crimes than those offenders who operate

in rural environments, even when an offence involves a person as the target rather than a specific property. Warren et al., (1998), for example, found that offenders' mean journey to crime distance in rural areas was 5.38 km, as opposed to 2.40 km for offenders living in cities. At a more local level, as Laukannen (2007) suggests, environmental factors such as obstacles, routes to targets or different street network systems may influence or obstruct spatial behaviour. He gives an example; "rivers, lakes, sea and locked buildings may hinder travel from point A to B" (p.22).

9.5.4 Behavioural structure of serial rape

Consistency of the particular behavioural themes within the linked offences was not examined. This was because the behavioural structure could not be examined as it was for main sample; it was not considered appropriate to carry out an SSA all of cases in the linked sample because of the potential distortions the repetition of particular behaviours would have caused (Sturidsson et al., 2006). Using one random offence from each series would not have been feasible as the sample size was too small (n = 17). Therefore, future research should examine the behavioural structure of a greater number of linked cases, either using SSAs or other methods. Then, the consistency of any behavioural themes could be established.

9.5.5 Data source

Although the data set used was a unique, localised sample, there were several limitations with using an archival source, namely the Metropolitan Police Service's Crime Information Recording System (CRIS). These are outlined in full in Chapter Two and include consistency, face validity, generalisability of information recorded into the database, as well as the inherent biases associated with using victim statements as an accurate account of the sequence and content of the rapes (including distortions of memory and the possibility of Rape Trauma Syndrome). Information collected in such a source is not collected for use in psychological study (Alison et al., 2001) and, therefore, useful information that may add to our understanding of rapists' spatial and offence behaviour may not be recorded. The other main limitation of this thesis is that it was not possible to triangulate data collected. Offender and police interviews would have supplemented information and counter-balanced biases inherent in CRIS. The present study was limited, in so far as, background characteristics of offenders only really considered the offence histories of offenders. Thus important characteristics such as psychiatric history would have useful to examine.

However, it is generally understood that using police data has drawbacks (Farrington

& Lambert, 1992) and that, sometimes, the only way to measure phenomena such as stranger rape is to do so using police records. Future research, however, could be carried out on data from other police forces, perhaps in smaller, less populated areas to see if the results found within the Metropolitan Police Service could be applied to other areas or if other issues or patterns are discovered. Other research methods could also be used to triangulate results; interviewing stranger rapists may offer a more in-depth insight into motivational goals, levels of planning and aggression and target location choice. Previous research (for example Beauregard et al., 2007b) has examined such notions using incarcerated serial rape samples but there is a need to replicate such research in UK samples, especially at a localised, force-wide level.

9.5.6 Using a detected sample

Another limitation of the sample used throughout the thesis is that the crimes are detected. Thus results found and conclusions drawn from this study may not be applicable to undetected crimes. Evidently, several offender characteristics such as previous offence history, precise age and journey to crime distances would not be known if offences are not detected. However, *Geo-mobility styles*, offence behaviours as well as *Inter-approach*[25] and *inter-Crime distances* could well be examined in undetected cases. Therefore, future studies should explore the geo-behavioural nature of undetected[26] cases and compare these with detected cases. The reasons why crimes were detected may be to do with particular behaviours exhibited within the crimes anyway. For instance, in some *Abducted* cases, the offender would take the victim back to his house, which has obvious risks of apprehension. It would be interesting to compare these results to the use of a disguise in undetected cases; does the use of a disguise decrease apprehension?

9.5.7 Using address data

Using address data is sometimes difficult, especially concerning the preciseness and accuracy of initial and attack location, as well as the problems of determining where an offender lived at the time of the offence (see Chapter Two for a discussion around this). It is also noted that considering the offender's home base as the 'anchor' from which he carries out his offence is sometimes problematic; he may indeed live a transient lifestyle or use friends or partner's houses as a base and will not always set off directly from his home base

[25] This could only be used if the offences were already linked by other means.
[26] The analysis of undetected crimes also comes with limitations; these may be carried out by repeat offenders, potentially biasing results.

to commit crimes. Indeed, Rengert et al., (1999) found that offenders can actually start their journey from a point more than a mile away from their home. Although this limitation is noted, it is clear that where the offenders live, or have lived can be a particularly important influence on their spatial behaviour and thus is a good starting point. Future research, however, should research the different anchor-points used by rapists to in addition to their home location.

9.5.8 Using Smallest Space Analysis to examine offence behaviours

Smallest Space Analysis has been used many times to examine behavioural structure in crimes such as rape and the present study found a similar structure to other studies such as Canter et al., (2003). However, some authors have failed to replicate the behavioural structure found within these studies (Sturidsson et al., 2006) and have called in to question the use of multi-dimensional scaling to examine motivational aspects of sexual offences. Others indicate that although SSA is useful at exploring conceptual issues, the practical utility of using such methods to classify offences into a dominant theme as been called into question (Goodwill & Alison, 2007). Thus, the use of the SSA to examine the way in which the geo-mobility styles are associated with particular behavioural themes should be thought of as an exploration of the conceptual issues involved (that is, ideas about planning and aggression) rather than considering the SSA as a way of classifying offences. Future research can clarify issues, using other MDS techniques, such as cluster or factor analysis.

Another criticism made by Sturidsson et al., (2006) is that past studies using SSAs (such as Canter & Heritage, 1990) used a number of cases that had been committed by a the same offenders. Thus, across-offence behaviours may be similar or represent a development of the individuals' behaviour. Either way, over-emphasis on certain variables may have distorted the SSA configuration. This is a limitation within the present research; within the 112 offences used in the SSA analysis (Chapter Five), 10 offences had been committed by repeat offenders (so five offenders had each committed two offences). So, if the offenders had repeated certain behaviours across crimes, this could have affected the dispersal of variables on the plot. To account for this, only one offence per offender should have been used. However, as the number of such cases was few, and the consistency of offence behaviours was shown to be limited (Chapter Eight), it is proposed that the spatial configuration would have remained relatively stable. To improve upon this in the future, one offence for each offender should be selected at random for use in the SSA as per studies such as Canter et al., (2003).

9.5.9 Using logistic regression to predict offender characteristics

In Chapter Seven, any offender variables that were continuous were dichotomised for use in the logistic regressions. For example, the distance travelled from the offenders' home base to the initial approach location were categorised into two groups and each offender was given the value of either '0' or '1' to signify whether they had travelled less than the median distance or more than the median distance. This was so that all offender characteristics could be measured alongside each other and allowed for comparisons to be made on the subsequent ROC graphs. The disadvantage of doing so was that subtle differences between offenders may have been lost. Future studies, therefore, should consider the use of linear or multiple regression to explore the predictive validity of such relationships.

9.5.10 Conclusion to the thesis

The present thesis sought to examine how spatial and behavioural factors exhibited within a sample of stranger rapes related to one another and whether such knowledge is helpful for the investigative tasks of 'offender profiling' and case linkage. The thesis showed how situational factors could have an impact on behaviours exhibited and how this related to notions drawn from the field of personality psychology. The present study could not show support for one of the basic assumptions of offender profiling, namely homology, but did show that particular aspects of the offences could be useful in linking offences to a serial offender.

There are three crucial findings that can be drawn from this thesis. Firstly, offence behaviours do not stand alone, in a vacuum, independent from environmental, victim and offender influence. Rape, like other interpersonal events, has been shown to be a dynamic, fluid incident and must be studied as such. Secondly, offenders will return to places within which they have previously encountered victims in order to find another. This knowledge highlights the necessity for the police to systematically record not only the crime location itself but also the initial approach location. Thirdly, the overall offence behaviour exhibited within two linked offences has been found to be relatively consistent. This study gives a diagnostic threshold for crime analysts to use to more accurately make decisions about whether two crimes are linked to a common offender.

The entire thesis provides a picture of the nature of solved stranger rapes across London. Such information is vital in the intelligence gathering process that is so vehemently encouraged throughout policing world-wide. By engaging in such research, academia can

make an important contribution to the investigation of rape and, ultimately, to protecting victims from this violent offence.

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APPENDICES

Appendix 1: Abbreviations used

Abbreviation	Definition
ABE	Achieving Best Evidence interview
BOCU	Borough Operational Command Unit
CRIS	Criminal Records Information System
FME	Forensic Medical Examiner
GIS	Geographical Information System
MPS	The Metropolitan Police Service
NFA	No fixed Abode
PAF	Postal Address Finder
PNC	Police National Computer
QAS	Quick Address Software
SARC	Sexual Assault Referral Centre
SOCO	Scene of Crime Officer
SOIT	Sexual offences Investigation Techniques Trained officers

Appendix 2: Terms used

Term	Definition
Accused	The offender after arrest
Suspect	The offender before arrest
Detected	The offence after an arrest
Undetected	The offence before an arrest
No crime	No offence was committed
Transferred	The offence occurred Outdoors MPS jurisdiction

Appendix 3: Fictitious CRIS report

CR Summary
CR No: 9999999/05
==========
General Info:
Allegation [Rape of a Female Aged under 16]
Committed on/from [DAY] [DATE TIME]
Committed to [DAY] [DATE TIME]
Reported Date [DAY] [DATE TIME]
How reported [Telephone to STN]
Invest Officer : [POLICE OFFICER]

Summary :
Crime last updated [DATE TIME]
Totals - VIW [3] PROP [0] VEH [0] SUSP [1] ACC [1]

Suitable for Press [N] Send to Press [N]
==========
==========
Venue :
Address [ADDRESS]
Grid ref [EASTING NOTHING] Local Id [VK14]
Location Type [Flat/Maisonette]

==========
==========
VIW : 1 of 3 (VICTIM)
Name [MISS] [VICTIM]
Address [ADDRESS PARK]
Tel - home [NUMBER]
Tel - mobil [NUMBER]
Birth date [DATE] Age [AGE] Sex [F] Ethnic appearance [3]
Occupation [SCHOOLGIRL] Occupation relevant to offence? [N]
Injury [Minor] [pain to stomach] Witness albums visited [N]

Action Taken Date Entered By
[EA] [VSS Informed] [16/12/2005] [POLICE OFFICER]
[MD] [CSS Not Suitable] [16/12/2005] [POLICE OFFICER]
[DA] [Victim of Cr. Leaf.] [16/12/2005] [POLICE OFFICER]
[AZ] [SI - General Letter] [16/12/2005] [POLICE OFFICER]
[HA] [VU - Arrest] [16/12/2005] [POLICE OFFICER]
[HJ] [VU - Ongoing Enqys] [16/12/2005] [POLICE OFFICER]
[HO] [see dets] [16/12/2005] [POLICE OFFICER]
==========
==========
VIW : 2 of 3 (INFORMANT 1)
Name [MISS] [NAME]

Appendix 3: Fictitious CRIS report (continued).

Address [ADDRESS]
Tel - mobil [NUMBER] Age [AGE] Sex [F] Ethnic appearance [3]
Occupation relevant to offence? [N] Witness albums visited [N]
==========
==========
VIW : 3 of 3 (WITNESS 1)
Name [NAME]
Address [ADDRESS]
Tel - mobil [NUMBER] Age [AGE] Sex [F]
Occupation relevant to offence? [N] Witness albums visited [N]
OIC notes [VIW1 states she was buzzed into the block of flats by INFORMANT 1 at no
13.]
==========
==========
SUSP : 1 of 1
Status [Suspected] Eliminated [Y]
Elimination [DATE] [AA]
Name [NAME]]
Address [ADDRESS
]
Birth date [DATE]
Age [AGE] Sex [M] Ethnic app [3]
Dress [black top]
Compos desc [N]
==========
==========
ACC : 1 of 1
Name [NAME]
Name [NAME]
Address [ADDRESS
]
Home LIO [BOROUGH CODE]
Occupation [UNEMPLOYED] Occ relevant [N]
Birth date [DATE] Age [AGE] Sex [M] Ethnic App [3]
Nationality [BRITAIN]
Pre cons? [Y]
VIW no [1] Known? [Y] How known [Neighbour of victim] Identifiable by? [Y]
Arr date [DATE] How arrested [R of E]
Arr by POLICE OFFICER]
Stn/Branch [STATION CODE]
Custody no [NUMBER
Offence [rape]
Proc code [3rd Time (or more) Charged] Proc date [DATE]

Appendix 3: Fictitious CRIS report (continued).

Charge date [DATE] Police Bail [N]
Court app [First App'nce at] Court [COURT NAME] Bail? [N]
Charge 1 :
==========
==========
Details of Investigation :
The following was entered by [POLICE OFFICER]

DETAILS OF INITIAL CONTACT WITH VICTIMDETAILS OF OFFENCE

DETAILS OF THE SCENE

DETAILS OF POTENTIAL FORENSIC EVIDENCE

The following was entered by [POLICE OFFICER]

BACKGROUND OF VICTIM

The following was entered by [POLICE OFFICER]

DETAILS OF THE ARREST

At present the suspect is in custody awaiting interview. He has been seen by the Doctor and intimate samples have been taken. He needs an appropriate adult and disclosure has been given to the solicitor,. They are currently in consultation.

The victim is at home having been at the Haven all night. It is anticipated that she will be ABE interviewed later this afternoon in order for her full account to be obtained.
The victim has no obvious physical injuries.
The scene has been fully forensically examined and photographed overnight.
This morning scenes of crimes officers have returned and taken lifts of fingerprints from the scene.

The following was entered by [POLICE OFFICER]

REVIEW

1. VICTIM CARE

2. SUSPECT DETAILS
3. FORENSIC OPPORTUNITIES
4. WITNESSES
5. CCTV
6. PROPERTY
7. CRIME PREVENTION
8. QUALITY ASSURANCE

Appendix 3: Fictitious CRIS report (continued).

9. INVESTIGATION PRIORITIES

The following was entered by [POLICE OFFICER]

DETAILS OF ABE INTERVIEW WITH VICTIM

The following was entered by [POLICE OFFICER]

DETAILS OF SUSPECT INTERVIEW

DETAILS OF CPS DECISION

Features/Instruments/Marks :
Features [Victim pushed] [Other attack] [Susp.unclothed]
Text [EO-victim dragged]

DETAILS OF POLICE MEMOS

CLASS :
Current Position [Classified]
Method [By suspect having sexual intercourse with the victim in his bedroom after dragging her Indoors without her consent.]

[Rape of a Female Aged under 16] CP Analysis [Z]
Current status [Detected Crime]
Cleared up reason [Ch/Summ-Prev. Undet] Date [DATE]

Appendix 4: General offence variables

Variable	Level of measurement	Definition
Month of year	Categorical: January to December	The month of the year in which the crime was committed
Day of week	Categorical: Monday to Sunday	The day of the week on which the rape was committed
Time of day	Categorical: 2300-0559 1800-2259 1400-1759 0600-1359	The time of day at which the rape was committed

Appendix 5: Victim background variables

Variable	Level of measurement	Definition
Victim age	**Continuous**: In years	Victim age at the time of the offence
Victim age categories	**Categorical:** 13-15 16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75	Victim age category at the time of the offence
Victim ethnicity	**Categorical**: White European Dark European Afro-Caribbean Asian Oriental Other	The victim's ethnic appearance (MPS categories)

Appendix 6: Offender background variables

Variable	Level of measurement	Definition
Offender age	**Continuous**: In years	Offender age at the time of the offence
Offender age categories	**Categorical:** 13-15 16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75	Offender age category at the time of the offence
Offender age at first offence	**Continuous**: In years	Offender age at first offence
Offender age at first offence categories	**Categorical:** 13-15 16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75	Offender age category at first offence
Offender ethnicity	**Categorical**: White European Dark European Afro-Caribbean Asian Oriental Other	The offender's ethnic appearance (MPS categories)

Appendix 6: Offender background variables (continued)

Offender and victim background variables		
Distance to Initial approach location	**Continuous**: In kilometres	The distance from the offenders' base to the Initial approach location.
Distance to Crime location	**Continuous**: In kilometres	The distance from the offenders' base to the Crime location.
Offence history		
Burglary offence	**Categorical**: Yes or no	The offender had a Burglary offence in his CRIS background
Criminal damage offence	**Categorical**: Yes or no	The offender had a Criminal damage offence in his CRIS background
Drugs offence	**Categorical**: Yes or no	The offender had a Drugs offence in his CRIS background
Fraud offence	**Categorical**: Yes or no	The offender had a Fraud offence in his CRIS background
Motoring offence	**Categorical**: Yes or no	The offender had a Motoring offence in his CRIS background
Other offence	**Categorical**: Yes or no	The offender had another Other offence (this did not fit into other categories) in his CRIS background
Robbery offence	**Categorical**: Yes or no	The offender had a Robbery offence in his CRIS background
Theft and handling offence	**Categorical**: Yes or no	The offender had a Theft and handling offence in his CRIS background
Sexual offence	**Categorical**: Yes or no	The offender had a Sexual offence in his CRIS background
Violent offence	**Categorical**: Yes or no	The offender had a Violent offence in his CRIS background
Age at first offence	**Categorical**: In years	The offenders' age when first recorded in CRIS
Median distance to previous offence	**Continuous:** In kilometres	The median distance from the offenders' base to previous offences.
Mean, mean-inter-point distances between previous offences	**Continuous:** In kilometres	The mean, mean inter-point distance between previous offences.

Appendix 7: Spatial variables

Variable	Level of measurement	Definition
Number of locations	**Continuous:** 1-4	The number of different locations used within the offence. The locations are: Initial approach location, Attack location, Crime location, Victim release location)
Type of location[27] – Specific location		
Alleyway, Footpath, subway	**Categorical**: Yes or no	The location was an alleyway, Footpath or a subway.
Bus or train	**Categorical**: Yes or no	The location was a bus or train.
Bus or train station	**Categorical**: Yes or no	The location was a bus or train station (either an underground or mainline station).
Car	**Categorical**: Yes or no	The location was a car.
Car park	**Categorical**: Yes or no	The location was an indoor car park.
Garden	**Categorical**: Yes or no	The location was a residential front, side or back garden.
Nightclub	**Categorical**: Yes or no	The location was a night club, public house or bar.
Park, common, open space, cemetery	**Categorical**: Yes or no	The location was a public park, common, another open space (for example, a field) or a cemetery.
Public toilet	**Categorical**: Yes or no	The location was a public toilet (not within another building).
Shop	**Categorical**: Yes or no	The location was a retail shop.
Stairwell, escalator, lift	**Categorical**: Yes or no	The location was a stairwell, escalator or lift within a block of flats or an apartment building.
Street	**Categorical: Yes or no**	The location was a street (within a residential, commercial or industrial area).
Suspect's house	**Categorical: Yes or no**	The location was within the suspect(s) house or another residential building that he had access to.
Victim's house	**Categorical: Yes or no**	The location was the victim's house.

[27] These variables were used to code type of Initial approach, Attack, Crime and Victim release location.

Appendix 7: Spatial variables (continued)

Transportation – Specific method used		
Bicycle	**Categorical**: Yes or no	The offender travelled by bicycle at some point in the offence.
Bus	**Categorical**: Yes or no	The offender travelled by bus at some point in the offence.
Car	**Categorical**: Yes or no	The offender travelled by car at some point in the offence.
Foot	**Categorical**: Yes or no	The offender only appeared to travel on Foot.
Train	**Categorical**: Yes or no	The offender travelled by train at some point in the offence.
Distance measure		
Distance travelled within offence	**Continuous: In kilometres**	The distance from the Initial approach location to the Crime location.
Variable Location set	Level of measurement	Definition
IAACVR	**Categorical**: Yes or no	The offender used one location for the whole offence (he initially approached, attacked, committed the crime, and released the victim in the same place).
IA_ACVR	**Categorical**: Yes or no	The offender approached the victim in one location then moved to another location to attack, commit the crime and release the victim.
IA_A_CVR	**Categorical**: Yes or no	The offender approached the victim in one location, moved to another location to attack her, moved to another location to commit the crime and then released the victim in the same place as he committed the crime.
IA_A_C_VR	**Categorical**: Yes or no	The offender used four different locations (he initially approached, attacked, committed the crime, and released the victim in different places).
IAA_C_VR	**Categorical**: Yes or no	The offender initial approached and attacked the victim in the same place, moved to another location to commit the crime and released the victim in the same location as he committed the crime.
IAA_CVR	**Categorical**: Yes or no	The offender initially approached and attacked the victim in the same place and then moved to another location to commit the crime and release the victim.

Appendix 7: Spatial variables (continued)

Variable	Level of measurement	Definition
IAA_C_VR	**Categorical**: Yes or no	The offender initially approached and attacked the victim in the same place and then moved to another location to commit the crime and to another location to release the victim.
IAAC_VR	**Categorical**: Yes or no	The offender initially approaches, attacks and commits the crime in one location and moves to another location to commit the crime.
Type of location[28] - Public or private		
Indoors private	**Categorical**: Yes or no	An Indoors place that is privately owned or to where the general public do not have access (the victim or suspect's house or other private residence; a shop or place of work that is closed).
Indoors semi-public	**Categorical**: Yes or no	An Indoors place that is privately owned but to where the general public limited access) (a public toilet, a communal area such as a lift or stairwell, shop).
Outdoors semi-public	**Categorical:** Yes or no	An Outdoors semi-public place that is privately owned but to where the general public have limited access (front garden, driveway)
Outdoors public	**Categorical:** Yes or no	(An Outdoors public place where the general public have open access (street, alleyway, park or common)
Private transport	**Categorical:** Yes or no	Transport that is owned by a private individual and used by that private individual or named drivers (car, motor-cycle, bicycle)
Public transport	**Categorical:** Yes or no	Transport that is owned by public or private companies and is used by the general public (bus, train, tram).
Movement between locations		
Movement[29]	**Categorical**: 1 = Forced 2 = Not forced	Movement between locations (if any)

[28] These variables were used to code type of Initial approach, Attack, Crime and Victim release location.
[29] This movement can be measured between Initial approach location and Attack location, Attack location and Crime location, and Crime location and Victim release location.

Appendix 7: Spatial variables (continued)

Geo-mobility style		
Intruded	**Categorical:** Yes or no	There is no movement from one location to another and the offence is carried out in an indoor private location.
Ambushed	**Categorical:** Yes or no	There is no movement from one location to another and the entire offence is carried out in an outdoor public location.
Abducted	**Categorical:** Yes or no	The offender forcibly moved the victim from one place to another to commit the offence (these locations can be public or private, indoor or outdoor).
Followed	**Categorical:** Yes or no	The offender moved, without force, from Initial approach location to Attack location where he committed the crime and released the victim in the same location (these locations can be public or private, indoor or outdoor).

Appendix 8: The original coding dictionary

	Variable	Definition	Cohen's Kappa
1.	Alcohol drank	The offender drank alcohol during the offence (not that the offender smelt of alcohol, because this would be an action before the offence).	1
2.	Allowed to leave	The offender allowed the victim to leave (verbally).	1
3.	Anal penile	The offender attempted to or achieved penile penetration of the victim's anus.	1
4.	Anal digital	The offender attempted to or achieved penetration of the victim's anus with his finger.	1
5.	Apologised	The offender apologised to the victim.	1
6.	Attracted attention	The offender beckoned, whistled or shouted only a short phrase (for example, 'hey') at the victim to attract her attention.	0.78
7.	Bit	The offender bit the victim or gave the victim a 'love-bite.'	1
8.	Blindfolded hand	The offender covered or blindfolded the victim's eyes with his hand or hands.	1
9.	Blindfolded material	The offender covered or blindfolded the victim's eyes with material.	1
10.	Blitz	The offender approached the victim with sudden, injurious force. For example, punched the victim when approaching her.	1
11.	Boasted	The offender boasted (for example, his sexual prowess).	1
12.	Bound	The offender bound any part of the victim's body with material or other items.	1
13.	Breasts	The offender sucked or kissed the victim's breasts.	1
14.	Cared Liked Loved	The offender told the victim he cared, liked or loved her.	1
15.	Cleaned teeth	The offender forced the victim to clean her teeth.	1
16.	Commented penis	The offender commented on his penis.	1
17.	Commented on own performance	The offender commented on his own sexual 'performance'.	1
18.	Commented offender sexual arousal	The offender commented on his own sexual arousal	1
19.	Complimented	The offender complimented the victim on her physical appearance.	1
20.	Conditional threat	The offender ordered, asked or wanted the victim to behave in a particular way or he would threaten her.	1

Appendix 8: The original coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
21.	Confidence	The offender used a confidence approach (a verbal interaction).	1
22.	Condom	The offender used a condom and/or the victim saw a condom brought by the offender.	1
23.	Control violence	The offender used violence that controlled the victim such as dragged, grabbed, jumped on, pinned down, restrained arms, pulled (including victim's hair), pushed or tripped the victim.	1
24.	Cuddled	The offender cuddled the victim or requested a cuddle from the victim or put his arm around her (but not as a restraint).	1
25.	Cunnilingus	The offender performed cunnilingus on the victim (licked her vagina).	1
26.	Directed co-offender	The offender directed his co-offender to carry out a particular behaviour.	1
27.	Disguise	The offender used some kind of disguise to protect his identity, for example, covered his face.	1
28.	Disturbed	The offender was disturbed by a witness or a sound and stopped the offence.	1
29.	Drugs smoked	The offender smoked drugs during the offence.	1
30.	Ejaculated	The offender ejaculated in or on the victim's body, his hand, her mouth or somewhere else.	1
31.	Endearment term	The offender used a term of endearment to refer to the victim for example, 'darling' or 'baby.'	1
32.	Erection	The offender had a 'full' erection.	0.74
33.	Erectile dysfunction	The offender stated, or the victim saw or felt that he was unable to achieve or maintain an erection.	1
34.	Excused or justified	The offender excused his behaviour by explaining that it was not his free will (for example, he raped because of drugs), by explaining that he needed to do it, by telling the victim a sad tale; he justified his behaviour by minimising the offence (for example, "It wasn't that bad was it", or by implying that the victim deserved to be raped.	1
35.	Extended time	The offender spent time or attempted to spend time (for example, asked her to come back to his flat) with the victim.	0.67
36.	Fellatio	The victim was forced to perform fellatio on the offender.	1
37.	Fondled	The offender fondled, touched or stroked the victim's body, bottom, anus, vagina or breasts for pleasure with his hand, penis or a knife (not breast or bottom). This was does not include the offender touching the victim's body to force her to come with him or as a restraint.	0.47

Appendix 8: The original coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
38.	Foreign language	The offender was speaking in a language that was not the victim's first language. (This is not that the offender had a foreign accent; just that the victim could not understand some or all of the offenders' speech).	1
39.	Gagged hand	The offender gagged the victim using his hand.	1
40.	Gloves	The offender was wearing gloves.	1
41.	Hair covered	The offender covered his hair.	1
42.	Held hand	The offender held the victim's hand or hands.	1
43.	Implied knowing	The offender implied knowing or seeing the victim before the incident.	1
44.	Joked laughed	The offender made jokes or laughed.	1
45.	Kissed	The offender ordered or asked to or did kiss the victim's mouth, face, neck or other parts of her body (except for genitalia or breasts).	1
46.	Left weapon	The offender left his weapon at the scene.	1
47.	Liar	The offender called the victim a liar or told the victim that she was lying.	1
48.	Locked in	The offender locked the victim in a car, room or building or prevented the victim from leaving (for example, parking his car next to railing so she could not open the car door.)	1
49.	Look out	One of the offenders acted like a look out.	1
50.	Made phone call	The offender made a phone call during the offence.	1
51.	Marry	The offender told the victim they could get married.	1
52.	Masturbated hand	The offender masturbated himself with his hand.	1
53.	Meet up	The offender ordered, asked or wanted to meet up with the victim with her after the offence.	1
54.	Multiple offenders	There was more than one offender.	1
55.	Multiple penetration	The offender penetrated or attempted to penetrate the victim in more than one way or more than one time in the same way (for example, vaginal, anal, digital, fellatio). This does not include multiple attempts when the offender is suffering from erectile dysfunction.	1
56.	Multiple victims	There was more than one victim.	1
57.	Multiple violence	The offender committed more than one act of physical (not control) violence.	1
58.	Non-alcoholic drank	The offender drank a non-alcoholic drink.	1

Appendix 8: The original coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
59.	No hear	The victim could not hear what the offender was saying.	1
60.	Non sexual questions	The offender asked the victim's name, address, age, victim deeper background questions such as if she had HIV, her occupation, her living arrangements, whether she took drugs or smoked, or non-sexual questions about her partner (for example, did she have a boyfriend?).	1
61.	No speech	The offender did not speak at all.	1
62.	Observed	The offence was observed by a co-offender (but the co-offender was not complicit in the physical behaviours of the rape, for example, did not help restrain the victim's arms).	1
63.	Offered assistance	The offender offered the victim help verbally or non-verbally (for example, helped the victim up).	1
64.	Offered pay	The offender offered to pay the victim.	1
65.	Ordered come	The offender ordered or asked the victim to move, come with him, come over to him, follow him, walk with him, go with him, continue walking or accompany him, or to open a door and go through it.	0.67
66.	Ordered comment non-sexual	The offender ordered or asked the victim to comment on no-sexual matters, such as his appearance or his clothing.	1
67.	Ordered comment sexual	The offender ordered or asked the victim to comment on his penis, his sexual 'performance.'	1
68.	Ordered no look	The offender ordered or asked the victim not to look at him or his face, not to watch him when he escapes and not to look at anything else that might reveal his identity (for example, car registration details).	0.78
69.	Ordered no noise	The offender ordered or asked the victim not to make any noise, to shut up, to be quiet, not to scream or shout or to shush.	0.91
70.	Ordered no report	The offender ordered or asked the victim not to report the offence.	1
71.	Ordered property	The offender ordered or asked the victim to give him property to steal (money, bag, and mobile phone for example).	1
72.	Ordered redress	The offender ordered or asked the victim to redress herself.	1
73.	Ordered sexual activity	The offender ordered, asked or wanted (or announced that he wanted) the victim to have sexual intercourse with him, to perform a sexual act including fellatio, or to 'help' him when he was trying to penetrate her vagina or anus.	0.78

Appendix 8: The original coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
74.	Ordered stay no move	The offender ordered or asked the victim not to move, not to run away, not to escape, to be still, not to stand up, not to struggle or resist, or to keep calm. This does not relate to the end of the attack, if the offender tells the victim not to move while he escapes (this would be coded as *order wait escape* as below).	0.74
75.	Ordered wait escape	The offender ordered or asked the victim to wait or not to move before escaping or leaving the scene or to wait before reporting the offence.	1
76.	Ordered undress	The offender ordered or asked the victim to undress, take all her clothes off, or to lift, unzip or take off one or more items of clothing	1
77.	Penis testicles pubic hair touched masturbated	The offender forced the victim to touch or masturbate his penis, testicles or pubic hair.	1
78.	Phone smashed wires cut	The offender smashed the victim's phone, cut the wires to her landline or pulled the wires from the wall.	1
79.	Physical violence	The offender used an act of physical violence such as cutting or scratching, hitting (including the victim's head against the ground or wall), kicking, gauging at her eyes, punching knocking her down, slapping or strangling the victim (the latter is only cases where the victim reported being 'strangled' or that the offender was squeezing her throat, as opposed to grabbing the victim's neck). Please note that if the language used is, for example, "the offender started to punch her in the face" then this is coded as multiple violence as it implies that the action occurred on more than one occasion.	1
80.	Placed pad	The offender placed a pad under the victim.	1
81.	Positioned	The offender verbally or physically forced the victim into a particular position.	0.47
82.	Ran off	The offender ran off or left suddenly ('made off', 'decamped')	0.67
83.	Reassured	The offender reassured the victim by offering her a contract (an offer in return for an action), by 'playing down' his actions (for example, "don't worry"), by telling her he would not hurt her if she did what he told her to do or by lying to her about his intentions.	0.67
84.	Redressed himself	The offender redressed himself.	0.47
85.	Redressed victim	The offender redressed the victim.	1

Appendix 8: The original coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
86.	Requested help	The offender requested that the victim help him.	1
87.	Rummaged	The offender rummaged or searched through victim's bag, cupboards or drawers.	1
88.	Sat or laid beside victim	The offender sat or laid down beside the victim, not as part of the sexual act.	1
89.	Scripting verbal	The offender forces the victim to say a specific phrase (for example, victim to tell him she loved him) or 'or make noises as if she was enjoying it.	1
90.	Self-disclosure criminal	The offender told the victim about previous offences he had carried out	1
91.	Self-disclosure personal	The offender revealed his name, age, where he lived, his mobile telephone number, his drug use, his nationality or parentage, his occupation, his psychiatric history, about his family or relationships, or other personal information	1
92.	Self-disclosure lie	The information given by the offender was identified as being untrue.	N/A[30]
93.	Sexual questions	The offender asked the victim sexual questions about the sexual activities the victim had engaged with their partner (but not whether the victim has a partner or not), or whether she had has ever experienced different sexual acts, whether she was a virgin or how long it had been since she had had a specific act.	1
94.	Slept	The offender slept.	1
95.	Spat	The offender spat at the victim.	1
96.	Spat hand	The offender forced the victim to spit in his hand.	1
97.	Stole property	The offender stole or attempted to steal property from the victim.	1
98.	Stole underwear	The offender stole or attempted to steal the victim's underwear.	1
99.	Surprise	The offender approached the victim with an immediate show of physical or control. This includes the threat of violence (for example, breaking into the victim's house).	1
100.	Swallowed	The victim was forced to swallow the offender's semen.	1
101.	Switched lights off	The offender switched the lights off at the location.	1
102.	Talked to himself	The offender talked to himself. For example, the victim recalled the offender giving himself instructions such as "speak English."	1

[30] Due to reasons of confidentiality, the two independent coders were not permitted to see the offenders' real background details, such as their name, age or address. Therefore, Self-disclosure lie was not able to be examined for inter-rater reliability.

Appendix 8: The original coding dictionary (continued)

Variable	Definition	Cohen's Kappa
103. Threatened physical violence	The offender threatened the victim, himself or others with physical violence, death, abduction, further sexual violence, to damage her property, to gag her or to "come after" her.	1
104. Threatened weapon	The offender verbally threatened the victim with a weapon or a weapon was 'intimated' (that is, the offender told the victim he had a weapon but this was not necessarily seen). If the offender showed or behaviourally threatened the victim with a weapon, this would be coded in the '*weapon to scene*' and '*weapon from scene*' variables.	1
105. Taxi called	The offender called or flagged down a taxi.	1
106. Television radio	The offender turned on the television or radio.	1
107. Testicles in mouth	The offender forced the victim to put his testicles in her mouth.	1
108. Tobacco smoked	The offender smoked tobacco.	1
109. Torch	The offender used a torch.	1
110. Tore clothing	The offender tore the victim's clothing.	1
111. Unconditional threat	The offender threatened the victim without a condition (for example, "I will hurt you"; "I have a knife").	1
112. Undressed himself	The offender undressed himself (this is also the same as the offender taking his penis out of his trousers).	0.74
113. Undressed victim	The offender undressed the victim.	0.67
114. Vaginal digital	The offender penetrated the victim's vagina with his finger.	1
115. Vaginal penile	The offender penetrated the victim's vagina with his penis.	1
116. Vagina washed or cleaned semen	The offender washed or cleaned the victim's vagina or wiped his semen from the victim or other areas.	1
117. Verbal abuse	The offender was verbally abusive to the victim by using a demeaning term (including the terms "bitch" and "whore"), being racially abusive to the victim or calling her stupid.	1
118. Victim arousal	The offender commented on the victim's arousal, telling or asking her whether she was enjoying the offence, or asking her whether she enjoyed specific acts in general.	1
119. Walked off	The offender walked off ('left.')	0.67
120. Weapon from scene	The offender used a weapon from the scene (seen or felt by the victim).	1
121. Weapon to scene	The offender used a weapon brought to the scene (seen or felt by the victim).	1

Appendix 9: The final coding dictionary

	Variable	Definition	Cohen's Kappa
1.	Alcohol drank	The offender drank alcohol during the offence (not that the offender smelt of alcohol, because this would be an action before the offence).	1
2.	Allowed to leave	The offender allowed the victim to leave (verbally).	1
3.	Anal penile	The offender attempted to or achieved penile penetration of the victim's anus.	1
4.	Anal digital	The offender attempted to or achieved penetration of the victim's anus with his finger.	1
5.	Apologised	The offender apologised to the victim.	1
6.	Attracted attention	The offender beckoned, whistled or shouted only a short phrase (for example, 'hey') at the victim to attract her attention.	0.78
7.	Bit	The offender bit the victim or gave the victim a 'love-bite.'	1
8.	Blindfolded hand	The offender covered or blindfolded the victim's eyes with his hand or hands.	1
9.	Blindfolded material	The offender covered or blindfolded the victim's eyes with material.	1
10.	Blitz	The offender approached the victim with sudden, injurious force. For example, punched the victim when approaching her.	1
11.	Boasted	The offender boasted (for example, his sexual prowess).	1
12.	Bound	The offender bound any part of the victim's body with material or other items.	1
13.	Breasts	The offender sucked or kissed the victim's breasts.	1
14.	Cared Liked Loved	The offender told the victim he cared, liked or loved her.	1
15.	Cleaned teeth	The offender forced the victim to clean her teeth.	1
16.	Commented offender sexual arousal	The offender commented on his own sexual arousal	1
17.	Commented on own performance	The offender commented on his own sexual 'performance'.	1
18.	Commented penis	The offender commented on his penis.	1
19.	Complimented	The offender complimented the victim on her physical appearance.	1
20.	Conditional threat	The offender ordered, asked or wanted the victim to behave in a particular way or he would threaten her.	1
21.	Confidence	The offender used a confidence approach (a verbal interaction).	1
22.	Condom	The offender used a condom and/or the victim saw a condom brought by the offender.	1

Appendix 9: The final coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
23.	Control violence	The offender used violence that controlled the victim such as dragged, grabbed, jumped on, pinned down, restrained arms, pulled (including victim's hair), pushed or tripped the victim.	1
24.	Cuddled	The offender cuddled the victim or requested a cuddle from the victim or put his arm around her (but not as a restraint).	1
25.	Cunnilingus	The offender performed cunnilingus on the victim (licked her vagina).	1
26.	Directed co-offender	The offender directed his co-offender to carry out a particular behaviour.	1
27.	Disguise	The offender used some kind of disguise to protect his identity, for example, covered his face.	1
28.	Disturbed	The offender was disturbed by a witness or a sound and stopped the offence.	1
29.	Drugs smoked	The offender smoked drugs during the offence.	1
30.	Ejaculated	The offender ejaculated in or on the victim's body, his hand, her mouth or somewhere else.	1
31.	Endearment term	The offender used a term of endearment to refer to the victim for example, 'darling' or 'baby.'	1
32.	Erectile dysfunction	The offender stated, or the victim saw or felt that he was unable to achieve or maintain an erection.	1
33.	Excused or justified	The offender excused his behaviour by explaining that it was not his free will (for example, he raped because of drugs), by explaining that he needed to do it, by telling the victim a sad tale; he justified his behaviour by minimising the offence (for example, "It wasn't that bad was it", or by implying that the victim deserved to be raped.	1
34.	Fellatio	The victim was forced to perform fellatio on the offender.	1
35.	Foreign language	The offender was speaking in a language that was not the victim's first language. (This is not that the offender had a foreign accent; just that the victim could not understand some or all of the offenders' speech).	1
36.	Gagged hand	The offender gagged the victim using his hand.	1
37.	Gloves	The offender was wearing gloves.	1
38.	Hair covered	The offender covered his hair.	1
39.	Held hand	The offender held the victim's hand or hands.	1
40.	Implied knowing	The offender implied knowing or seeing the victim before the incident.	1
41.	Joked laughed	The offender made jokes or laughed.	1
42.	Kissed	The offender ordered or asked to or did kiss the victim's mouth, face, neck or other parts of her body (except for genitalia or breasts).	1

Appendix 9: The final coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
43.	Left weapon	The offender left his weapon at the scene.	1
44.	Liar	The offender called the victim a liar or told the victim that she was lying.	1
45.	Locked in	The offender locked the victim in a car, room or building or prevented the victim from leaving (for example, parking his car next to railing so she could not open the car door.)	1
46.	Look out	One of the offenders acted like a look out.	1
47.	Made phone call	The offender made a phone call during the offence.	1
48.	Marry	The offender told the victim they could get married.	1
49.	Masturbated hand	The offender masturbated himself with his hand.	1
50.	Meet up	The offender ordered, asked or wanted to meet up with the victim with her after the offence.	1
51.	Multiple offenders	There was more than one offender.	1
52.	Multiple penetration	The offender penetrated or attempted to penetrate the victim in more than one way or more than one time in the same way (for example, vaginal, anal, digital, fellatio). This does not include multiple attempts when the offender is suffering from erectile dysfunction.	1
53.	Multiple victims	There was more than one victim.	1
54.	Multiple violence	The offender committed more than one act of physical (not control) violence.	1
55.	Non-alcoholic drank	The offender drank a non-alcoholic drink.	1
56.	No hear	The victim could not hear what the offender was saying.	1
57.	Non sexual questions	The offender asked the victim's name, address, age, victim deeper background questions such as if she had HIV, her occupation, her living arrangements, whether she took drugs or smoked, or non-sexual questions about her partner (for example, did she have a boyfriend?).	1
58.	No speech	The offender did not speak at all.	1
59.	Observed	The offence was observed by a co-offender (but the co-offender was not complicit in the physical behaviours of the rape, for example, did not help restrain the victim's arms).	1
60.	Offered assistance	The offender offered the victim help verbally or non-verbally (for example, helped the victim up).	1
61.	Offered pay	The offender offered to pay the victim.	1

Appendix 9: The final coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
62.	Ordered comment non-sexual	The offender ordered or asked the victim to comment on no-sexual matters, such as his appearance or his clothing.	1
63.	Ordered comment sexual	The offender ordered or asked the victim to comment on his penis, his sexual 'performance.'	1
64.	Ordered no look	The offender ordered or asked the victim not to look at him or his face, not to watch him when he escapes and not to look at anything else that might reveal his identity (for example, car registration details).	0.78
65.	Ordered no noise	The offender ordered or asked the victim not to make any noise, to shut up, to be quiet, not to scream or shout or to shush.	0.91
66.	Ordered no report	The offender ordered or asked the victim not to report the offence.	1
67.	Ordered property	The offender ordered or asked the victim to give him property to steal (money, bag, and mobile phone for example).	1
68.	Ordered redress	The offender ordered or asked the victim to redress herself.	1
69.	Ordered sexual activity	The offender ordered, asked or wanted (or announced that he wanted) the victim to have sexual intercourse with him, to perform a sexual act including fellatio, or to 'help' him when he was trying to penetrate her vagina or anus.	0.78
70.	Ordered wait escape	The offender ordered or asked the victim to wait or not to move before escaping or leaving the scene or to wait before reporting the offence.	1
71.	Ordered undress	The offender ordered or asked the victim to undress, take all her clothes off, or to lift, unzip or take off one or more items of clothing	1
72.	Penis testicles pubic hair touched masturbated	The offender forced the victim to touch or masturbate his penis, testicles or pubic hair.	1
73.	Phone smashed wires cut	The offender smashed the victim's phone, cut the wires to her landline or pulled the wires from the wall.	1

Appendix 9: The final coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
74.	Physical violence	The offender used an act of physical violence such as cutting or scratching, hitting (including the victim's head against the ground or wall), kicking, gauging at her eyes, punching knocking her down, slapping or strangling the victim (the latter is only cases where the victim reported being 'strangled' or that the offender was squeezing her throat, as opposed to grabbing the victim's neck). Please note that if the language used is, for example, "the offender started to punch her in the face" then this is coded as multiple violence as it implies that the action occurred on more than one occasion.	1
75.	Placed pad	The offender placed a pad under the victim.	1
76.	Redressed victim	The offender redressed the victim.	1
77.	Requested help	The offender requested that the victim help him.	1
78.	Rummaged	The offender rummaged or searched through victim's bag, cupboards or drawers.	1
79.	Sat or laid beside victim	The offender sat or laid down beside the victim, not as part of the sexual act.	1
80.	Scripting verbal	The offender forces the victim to say a specific phrase (for example, victim to tell him she loved him) or 'or make noises as if she was enjoying it.	1
81.	Self-disclosure criminal	The offender told the victim about previous offences he had carried out	1
82.	Self-disclosure personal	The offender revealed his name, age, where he lived, his mobile telephone number, his drug use, his nationality or parentage, his occupation, his psychiatric history, about his family or relationships, or other personal information	1
83.	Self-disclosure lie	The information given by the offender was identified as being untrue.	N/A[31]
84.	Sexual questions	The offender asked the victim sexual questions about the sexual activities the victim had engaged with their partner (but not whether the victim has a partner or not), or whether she had has ever experienced different sexual acts, whether she was a virgin or how long it had been since she had had a specific act.	1
85.	Slept	The offender slept.	1
86.	Spat	The offender spat at the victim.	1
87.	Spat hand	The offender forced the victim to spit in his hand.	1

[31] Due to reasons of confidentiality, the two independent coders were not permitted to see the offenders' real background details, such as their name, age or address. Therefore, Self-disclosure lie was not able to be examined for inter-rater reliability.

Appendix 9: The final coding dictionary (continued)

	Variable	Definition	Cohen's Kappa
88.	Stole property	The offender stole or attempted to steal property from the victim.	1
89.	Stole underwear	The offender stole or attempted to steal the victim's underwear.	1
90.	Surprise	The offender approached the victim with an immediate show of physical or control. This includes the threat of violence (for example, breaking into the victim's house).	1
91.	Swallowed	The victim was forced to swallow the offender's semen.	1
92.	Switched lights off	The offender switched the lights off at the location.	1
93.	Talked to himself	The offender talked to himself. For example, the victim recalled the offender giving himself instructions such as "speak English."	1
94.	Threatened physical violence	The offender threatened the victim, himself or others with physical violence, death, abduction, further sexual violence, to damage her property, to gag her or to "come after" her.	1
95.	Threatened weapon	The offender verbally threatened the victim with a weapon or a weapon was 'intimated' (that is, the offender told the victim he had a weapon but this was not necessarily seen). If the offender showed or behaviourally threatened the victim with a weapon, this would be coded in the '*weapon to scene*' and '*weapon from scene*' variables.	1
96.	Taxi called	The offender called or flagged down a taxi.	1
97.	Television radio	The offender turned on the television or radio.	1
98.	Testicles in mouth	The offender forced the victim to put his testicles in her mouth.	1
99.	Tobacco smoked	The offender smoked tobacco.	1
100.	Torch	The offender used a torch.	1
101.	Tore clothing	The offender tore the victim's clothing.	1
102.	Unconditional threat	The offender threatened the victim without a condition (for example, "I will hurt you"; "I have a knife").	1
103.	Vaginal digital	The offender penetrated the victim's vagina with his finger.	1
104.	Vaginal penile	The offender penetrated the victim's vagina with his penis.	1
105.	Vagina washed or cleaned semen	The offender washed or cleaned the victim's vagina or wiped his semen from the victim or other areas.	1

Appendix 9: The final coding dictionary (continued)

Variable	Definition	Cohen's Kappa
106. Verbal abuse	The offender was verbally abusive to the victim by using a demeaning term (including the terms "bitch" and "whore"), being racially abusive to the victim or calling her stupid.	1
107. Victim arousal	The offender commented on the victim's arousal, telling or asking her whether she was enjoying the offence, or asking her whether she enjoyed specific acts in general.	1
108. Weapon from scene	The offender used a weapon from the scene (seen or felt by the victim).	1
109. Weapon to scene	The offender used a weapon brought to the scene (seen or felt by the victim).	1

Appendix 10: Variables used in the Smallest Space Analysis

	Variable	Definition	Cohen's Kappa
1.	Anal penile	The offender attempted to or achieved penile penetration of the victim's anus.	1
2.	Apologised	The offender apologised to the victim.	1
3.	Bit	The offender bit the victim or gave the victim a 'love-bite.'	1
4.	Blindfolded material	The offender covered or blindfolded the victim's eyes with material.	1
5.	Breasts	The offender sucked or kissed the victim's breasts.	1
6.	Complimented	The offender complimented the victim on her physical appearance.	1
7.	Condom	The offender used a condom and/or the victim saw a condom brought by the offender.	1
8.	Control violence	The offender used violence that controlled the victim such as dragged, grabbed, jumped on, pinned down, restrained arms, pulled (including victim's hair), pushed or tripped the victim.	1
9.	Cuddled	The offender cuddled the victim or requested a cuddle from the victim or put his arm around her (but not as a restraint).	1
10.	Disguise	The offender used some kind of disguise to protect his identity, for example, covered his face.	1
11.	Ejaculated	The offender ejaculated in or on the victim's body, his hand, her mouth or somewhere else.	1
12.	Erectile dysfunction	The offender stated, or the victim saw or felt that he was unable to achieve or maintain an erection.	1
13.	Excused or justified	The offender excused his behaviour by explaining that it was not his free will (for example, he raped because of drugs), by explaining that he needed to do it, by telling the victim a sad tale; he justified his behaviour by minimising the offence (for example, "It wasn't that bad was it", or by implying that the victim deserved to be raped.	1
14.	Fellatio	The victim was forced to perform fellatio on the offender.	1
15.	Gagged hand	The offender gagged the victim using his hand.	1
16.	Implied knowing	The offender implied knowing or seeing the victim before the incident.	1
17.	Kissed	The offender ordered or asked to or did kiss the victim's mouth, face, neck or other parts of her body (except for genitalia or breasts).	1
18.	Locked in	The offender locked the victim in a car, room or building or prevented the victim from leaving (for example, parking his car next to railing so she could not open the car door.)	1
19.	Masturbated hand	The offender masturbated himself with his hand.	1

Appendix 10: Variables used in the Smallest Space Analysis

	Variable	Definition	Cohen's Kappa
20.	Non sexual questions	The offender asked the victim's name, address, age, victim deeper background questions such as if she had HIV, her occupation, her living arrangements, whether she took drugs or smoked, or non-sexual questions about her partner (for example, did she have a boyfriend?).	1
21.	Ordered no look	The offender ordered or asked the victim not to look at him or his face, not to watch him when he escapes and not to look at anything else that might reveal his identity (for example, car registration details).	0.78
22.	Ordered no noise	The offender ordered or asked the victim not to make any noise, to shut up, to be quiet, not to scream or shout or to shush.	0.91
23.	Ordered no report	The offender ordered or asked the victim not to report the offence.	1
24.	Ordered property	The offender ordered or asked the victim to give him property to steal (money, bag, and mobile phone for example).	1
25.	Ordered redress	The offender ordered or asked the victim to redress herself.	1
26.	Ordered sexual activity	The offender ordered, asked or wanted (or announced that he wanted) the victim to have sexual intercourse with him, to perform a sexual act including fellatio, or to 'help' him when he was trying to penetrate her vagina or anus.	0.77
27.	Ordered wait escape	The offender ordered or asked the victim to wait or not to move before escaping or leaving the scene or to wait before reporting the offence.	1
28.	Ordered undress	The offender ordered or asked the victim to undress, take all her clothes off, or to lift, unzip or take off one or more items of clothing	1
29.	Penis testicles pubic hair touched masturbated	The offender forced the victim to touch or masturbate his penis, testicles or pubic hair.	1

Appendix 10: Variables used in the Smallest Space Analysis (continued).

	Variable	Definition	Cohen's Kappa
30.	Physical violence	The offender used an act of physical violence such as cutting or scratching, hitting (including the victim's head against the ground or wall), kicking, gauging at her eyes, punching knocking her down, slapping or strangling the victim (the latter is only cases where the victim reported being 'strangled' or that the offender was squeezing her throat, as opposed to grabbing the victim's neck). Please note that if the language used is, for example, "the offender started to punch her in the face" then this is coded as multiple violence as it implies that the action occurred on more than one occasion.	1
31.	Rummaged	The offender rummaged or searched through victim's bag, cupboards or drawers.	1
32.	Sat or laid beside victim	The offender sat or laid down beside the victim, not as part of the sexual act.	1
33.	Self-disclosure criminal	The offender told the victim about previous offences he had carried out	1
34.	Self-disclosure personal	The offender revealed his name, age, where he lived, his mobile telephone number, his drug use, his nationality or parentage, his occupation, his psychiatric history, about his family or relationships, or other personal information	1
35.	Sexual questions	The offender asked the victim sexual questions about the sexual activities the victim had engaged with their partner (but not whether the victim has a partner or not), or whether she had has ever experienced different sexual acts, whether she was a virgin or how long it had been since she had had a specific act.	1
36.	Stole property	The offender stole or attempted to steal property from the victim.	1
37.	Threatened physical violence	The offender threatened the victim, himself or others with physical violence, death, abduction, further sexual violence, to damage her property, to gag her or to "come after" her.	1
38.	Threatened weapon	The offender verbally threatened the victim with a weapon or a weapon was 'intimated' (that is, the offender told the victim he had a weapon but this was not necessarily seen). If the offender showed or behaviourally threatened the victim with a weapon, this would be coded in the '*weapon to scene*' and '*weapon from scene*' variables.	1
39.	Tobacco smoked	The offender smoked tobacco.	1
40.	Tore clothing	The offender tore the victim's clothing.	1

Appendix 10: Variables used in the Smallest Space Analysis (continued).

	Variable	Definition	Cohen's Kappa
41.	Vaginal digital	The offender penetrated the victim's vagina with his finger.	1
42.	Vaginal penile	The offender penetrated the victim's vagina with his penis.	1
43.	Verbal abuse	The offender was verbally abusive to the victim by using a demeaning term (including the terms "bitch" and "whore"), being racially abusive to the victim or calling her stupid.	1
44.	Victim arousal	The offender commented on the victim's arousal, telling or asking her whether she was enjoying the offence, or asking her whether she enjoyed specific acts in general.	1
45.	Weapon from scene	The offender used a weapon from the scene (seen or felt by the victim).	1
46.	Weapon to scene	The offender used a weapon brought to the scene (seen or felt by the victim).	1

Appendix 11: Descriptive statistics and Kruskal Wallis output for Age and Geo-mobility style

Geo-mobility style	Age			Test output	
	n	Median	Range	χ^2	*p*
Intruded	19	30	16-44	7.72	.05
Ambushed	31	22	15-37		
Abducted	64	22	15-48		
Followed	17	23	14-47		

Appendix 12: Descriptive statistics and Mann Whitney U output for Age and Initial approach location type

Location type	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	29	24.0	16-44	1074	.03	-0.20
Outdoors	102	22.0	14-48			

Appendix 13: Descriptive statistics and Mann Whitney U output for Age and Attack location type

Location type	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	32	27	16-47	1063	.005	-0.20
Outdoors	99	22	14-48			

Appendix 14: Descriptive statistics and Mann Whitney U output for Age and Crime location type

Location type	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	48	24	15-47	1589	.05	-0.17
Outdoors	83	22	14-48			

Appendix 15: Descriptive statistics and Mann Whitney U output for Age and Victim release location type

Location type	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	50	24	15-47	1728	.16	-0.12
Outdoors	81	22	14-48			

Appendix 16: Descriptive statistics and Mann Whitney U output for Age and Transportation type

Transportation type	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Foot	121	23	14-48	439	.15	-0.13
No Foot	10	26.5	18-40			

Appendix 17: Descriptive statistics and Mann Whitney U output for Age and Individual offence behaviours

Behaviour	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Anal penile	24	22	15-42	1172	.51	-0.06
No Anal penile	107	23	14-48			
Apologised	6	24.5	16-26	356.50	.84	-0.02
No Apologised	125	23	14-48			
Bit	8	21.5	16-36	364.50	.22	-0.11
No Bit	123	23	14-48			
Blindfolded material	11	24	17-44	536.50	.31	-0.09
No Blindfolded material	120	23	14-48			
Breasts	14	23	15-45	813.50	.97	0.00
No Breasts	117	23	14-48			
Complimented	13	23	15-42	696.50	.59	-0.05
No Complimented	118	23	14-48			
Condom	23	18	14-38	688	.001	-0.29
No Condom	108	24	15-48			
Control violence	114	23.5	14-48	835	.36	0.08
No Control violence	17	20	16-40			
Cuddled	12	24	14-48	700	.91	-0.01
No Cuddled	119	23	15-47			
Disguise	6	25.5	24-42	209	.07	-0.16
No Disguise	125	23	14-48			
Ejaculated	49	22	15-47	1744	.21	-0.11
No Ejaculated	82	24	14-48			
Erectile dysfunction	12	23	15-44	674	.75	-0.03
No Erectile dysfunction	119	23	14-48			
Excused or justified	7	19	16-48	359	.44	-0.07
No Excused or justified	124	23	14-47			
Fellatio	58	22	14-48	1983.50	.54	-0.05
No Fellatio	73	23	15-45			
Gagged hand	18	26	18-45	694	.31	-0.19
No Gagged hand	113	22	14-48			
Implied knowing	9	22	15-42	498.50	.65	-0.04
No Implied knowing	122	23	14-48			
Kissed	49	23	15-48	1850.50	.45	-0.07
No Kissed	82	23	14-47			
Locked in	12	22	16-38	704	.94	-0.01
No Locked in	119	23	14-48			
Masturbation hand	7	23	15-38	420	.89	0.01
No Masturbation hand	124	23	14-48			
Non sexual questions	26	19.5	15-48	1105.50	.13	-0.13
No Non sexual questions	105	24	14-47			
Ordered no look	12	31	22-42	356	.004	-0.25
No Ordered no look	119	23	14-48			
Ordered no noise	55	23	14-48	2005	.69	-0.03
No Ordered no noise	76	23	15-47			

Appendix 17: Descriptive statistics and Mann Whitney U output for Age and Individual offence behaviours (continued).

Behaviour	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Ordered no report	18	26.5	16-45	916	.50	-0.06
No Ordered no report	113	23	14-48			
Ordered property	30	24	14-44	1487	.88	-0.01
No Ordered property	101	23	15-48			
Ordered redress	11	23	15-36	581	.51	-0.06
No Ordered redress	120	23	14-48			
Ordered sexual activity	69	23	14-48	1862	.20	-0.11
No Ordered sexual activity	62	23.5	16-45			
Ordered wait escape	7	24	20-42	307.50	.20	-0.11
No Ordered wait escape	124	23	14-48			
Ordered undress	21	24	16-45	970.50	.25	-0.10
No Ordered undress	110	22.5	14-48			
Penis testicles public hair touched	12	23.5	15-48	661.50	.68	-0.04
No Penis testicles public hair touched	119	23	14-47			
Physical violence	47	20	14-42	1381.50	.004	-0.24
No Physical violence	84	24	15-48			
Rummaged	18	25	15-44	924	.53	-0.05
No Rummaged	113	23	14-48			
Sat or laid beside victim	7	24	14-34	363.50	.47	-0.06
No Sat Laid	124	23	15-48			
Self disclosure criminal	13	17	15-24	307	.000	-0.31
No Self disclosure criminal	118	24	14-48			
Self disclosure personal	37	22	14-48	1500	.22	-0.11
No Self disclosure personal	94	24	15-45			
Sexual questions	9	17	15-38	351.50	.07	-0.16
No Sexual questions	122	23.5	14-48			
Stole property	58	21.5	15-42	1629	.02	-0.20
No Stole property	73	24	14-48			
Threatened physical violence	40	24	14-42	1776.50	.83	-0.02
No Threatened physical violence	91	23	15-48			
Threatened weapon	31	20	14-45	1196	.06	-0.17
No Threatened weapon	100	23.5	15-48			
Tobacco smoked	6	29.5	20-34	211	.07	-0.16
No Tobacco smoked	125	23	14-48			
Tore clothing	13	24	15-42	756	.93	-0.01
No Tore clothing	118	23	14-48			
Vaginal digital	22	23.5	15-42	1155.50	.79	-0.02
No Vaginal digital	109	23	14-48			
Vaginal penile	95	23	15-47	1655	.78	-0.02
No Vaginal penile	36	23	14-48			

Appendix 17: Descriptive statistics and Mann Whitney U output for Age and Individual offence behaviours (continued)

Behaviour	Age			Test output		
	N	Median	Range	*U*	*p*	*r*
Verbal abuse	16	24	15-47	856.50	.66	-0.04
No Verbal abuse	115	23	14-48			
Victim arousal	15	27	15-45	631.50	.08	-0.15
No Victim arousal	116	23	14-48			
Weapon from scene	11	18	15-42	409.50	.04	-0.18
No Weapon from scene	120	24	14-48			
Weapon to scene	32	23.5	14-42	1524.50	.75	-0.03
No Weapon to scene	99	23	15-48			

Appendix 18: Percentages and Chi-Square output for Ethnicity v. Geo-mobility Style

	White		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 16.0% No Intruded: 84.0%	Intruded: 14.2% No Intruded: 85.8%	5.35	.15	.20
Ambushed	Ambushed: 40.0% No Ambushed: 60.0%	Ambushed: 19.8% No Ambushed: 80.2%			
Abducted	Abducted: 32.0% No Abducted: 68.0%	Abducted: 52.8% No Abducted: 47.2%			
Followed	Followed: 12.0% No Followed: 88.0%	Followed: 13.2% No Followed: 86.8%			

Appendix 19: Percentages and Chi-Square output for Ethnicity and Location Type

Variable	White		Test output		
Location Type	Yes	No	χ^2	*P*	ϕ
Initial approach	Indoors: 16.0% Outdoors: 84.0%	Indoors: 23.6% Outdoors: 76.4%	0.68	.41	0.07
Attack	Indoors: 20% Outdoors: 80%	Indoors: 25.5% Outdoors: 74.5%	0.33	.57	0.05
Crime	Indoors: 28% Outdoors: 72%	Indoors: 38.7% Outdoors: 61.3%	0.99	.32	0.09
Victim Release	Indoors: 32.0% Outdoors: 68.0%	Indoors: 39.6% Outdoors: 60.4%	0.50	.48	0.06

Appendix 20: Percentages and Chi-Square output for Ethnicity v. Transportation type

Variable	White		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 96.0% No Foot: 4.0%	Foot: 91.5% No Foot: 8.5%	0.58	.45	0.07

Appendix 21: Percentages and Chi-Square output for Ethnicity and Individual offence behaviours

Behaviour	White		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	28.0	16.0	1.93	.16	0.12
No Anal penile	72.0	84.0			
Apologised	4.0	4.7		1.00	-0.01
No Apologised	96.0	95.3			
Bit	0	7.5	2.01	.16	-0.12
No Bit	100	92.5			
Blindfolded material	8.0	8.5	0.01	.94	-0.01
No Blindfolded material	92.0	91.5			
Breasts	16.0	9.4	0.91	.34	0.08
No Breasts	84.0	90.6			
Complimented	20.0	7.5	3.51	.06	0.16
No Complimented	80.0	92.5			
Condom	8.0	19.8	1.95	.16	-0.12
No Condom	92.0	80.2			
Control violence	96.0	84.9	2.21	.14	0.13
No Control violence	4.0	15.1			
Cuddled	12.0	8.5	0.30	.58	0.05
No Cuddled	88.0	91.5			
Disguise	4.0	4.7		1.00	-0.01
No Disguise	96.0	95.3			
Ejaculated	40.0	36.8	0.09	.77	0.03
No Ejaculated	60.0	63.2			
Erectile dysfunction	8.0	9.4	0.05	.82	-0.02
No Erectile dysfunction	92.0	90.6			
Excused or justified	8.0	4.7	0.43	.51	0.06
No Excused or justified	92.0	95.3			
Fellatio	56.0	41.5	1.72	.19	0.12
No Fellatio	44.0	58.5			
Gagged hand	20.0	12.3	1.02	.31	0.09
No Gagged hand	80.0	87.7			
Implied knowing	0	8.5	2.28	.13	-0.13
No Implied knowing	100	91.5			
Kissed	48.0	34.9	1.48	.22	0.11
No Kissed	52.0	65.1			
Locked in	4.0	10.4	0.99	.32	-0.09
No Locked in	96.0	89.6			
Masturbation hand	8.0	4.7	0.43	.51	0.06
No Masturbation hand	92.0	95.3			
Non sexual questions	16.0	20.8	0.29	.59	-0.05
No Non sexual questions	84.0	79.2			
Ordered no look	24.0	5.7	8.18	.004	0.25
No Ordered no look	76.0	94.3			
Ordered no noise	52.0	39.6	1.27	.26	0.10
No Ordered no noise	48.0	60.4			

Appendix 21: Percentages and Chi-Square output for Ethnicity and Individual offence behaviours (continued).

Behaviour	White		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no report	8.0	15.1	0.86	.35	-0.08
No Ordered no report	92.0	84.9			
Ordered property	24.0	22.6	0.02	.88	0.01
No Ordered property	76.0	77.4			
Ordered redress	12.0	7.5	0.52	.47	0.06
No Ordered redress	88.0	92.5			
Ordered sexual activity	64.0	50.0	1.59	.21	0.11
No Ordered sexual activity	36.0	50.0			
Ordered wait escape	16.0	2.8	6.94	.008	0.23
No Ordered wait escape	84.0	97.2			
Ordered undress	32.0	12.3	5.85	.02	0.21
No Ordered undress	68.0	87.7			
Penis testicles public hair touched	20.0	6.6	4.36	.04	0.18
No Penis testicles public hair touched	80.0	93.4			
Physical violence	44.0	34.0	0.89	.35	0.08
No Physical violence	56.0	66.0			
Rummaged	20.0	12.3	1.02	.31	0.09
No Rummaged	80.0	87.8			
Sat or laid beside victim	12.0	3.8	2.71	.10	0.14
No Sat Laid	88.0	96.2			
Self disclosure criminal	12.0	9.4	0.15	.70	0.03
No Self disclosure criminal	88.0	90.6			
Self disclosure personal	36.0	26.4	0.92	.34	0.08
No Self disclosure personal	64.0	73.6			
Sexual questions	8.0	6.6	0.06	.80	0.02
No Sexual questions	92.0	93.4			
Stole property	40.0	45.3	0.23	.63	-0.04
No Stole property	60.0	54.7			
Threatened physical violence	36.0	29.2	0.44	.51	0.06
No Threatened physical violence	64.0	70.8			
Threatened weapon	16.0	25.5	1.01	.32	-0.09
No Threatened weapon	84.0	74.5			
Tobacco smoked	4.0	4.7		1.00	-0.01
No Tobacco smoked	96.0	95.3			

Appendix 21: Percentages and Chi-Square output for Ethnicity and Individual offence behaviours (continued)

Behaviour	White		Test output		
	Yes	No	χ^2	*p*	ϕ
Tore clothing	8.0	10.4	0.13	.72	-0.03
No Tore clothing	92.0	89.6			
Vaginal digital	28.0	14.2	2.78	.10	0.15
No Vaginal digital	72.0	85.8			
Vaginal penile	76.0	71.7	0.19	.67	0.04
No Vaginal penile	24.0	28.3			
Verbal abuse	16.0	11.3	0.41	.52	0.06
No Verbal abuse	84.0	88.7			
Victim arousal	28.0	7.5	8.35	.004	0.25
No Victim arousal	72.0	92.5			
Weapon from scene	4.0	9.4	0.78	.38	-0.08
No Weapon from scene	96.0	90.6			
Weapon to scene	36.0	21.7	2.24	.13	0.13
No Weapon to scene	64.0	78.3			

Appendix 22: Descriptive statistics and Kruskal Wallis output for Distance to Initial approach location and Geo-mobility style

		Distance (in km)		Test output	
	n	Median	Range	χ^2	*p*
Intruded	17	5.03	0.09-29.32	5.62	.13
Ambushed	28	1.12	0.00-31.04		
Abducted	55	4.10	0.00-21.07		
Followed	13	1.76	0.16-8.26		

Appendix 23: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Initial approach location type

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	27	4.25	0.09-29.32	1373	.15	0.13
Outdoors	86	1.63	0.00-31.01			

Appendix 24: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Attack location type

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	27	4.10	0.09-29.32	1332	.25	0.11
Outdoors	86	1.67	0.00-31.04			

Appendix 25: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Crime location type

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	39	2.02	0.09-29.32	1472	.86	0.02
Outdoors	74	2.08	0.00-31.04			

Appendix 26: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Victim release location type

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	42	2.61	0.09-29.32	1669	.29	0.10
Outdoors	71	1.66	0.00-31.04			

Appendix 27: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Transportation type

Transportation		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Foot	106	2.21	0.09-31.04	329	.62	-0.04
No Foot	7	1.76	0.31-14.94			

Appendix 28: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Individual offence behaviours

Behaviour	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Anal penile	22	1.34	0.09-14.29	812	.71	-0.13
No Anal penile	91	2.57	0.00-31.04			
Apologised	6	1.22	0.33-7.93	294	.73	-0.03
No Apologised	107	2.41	0.00-31.04			
Bit	7	2.75	0.49-14.29	301	.40	-0.08
No Bit	106	1.68	0.00-31.04			
Blindfolded material	10	2.24	0.29-13.11	492	.82	-0.02
No Blindfolded material	103	1.76	0.00-31.04			
Breasts	11	1.61	0.06-14.29	499	.55	-0.06
No Breasts	102	2.21	0.00-31.04			
Complimented	12	1.18	0.00-7.08	420	.08	-0.16
No Complimented	101	2.46	0.00-31.04			
Condom	19	1.39	0.00-14.94	699	.14	-0.14
No Condom	94	2.45	0.00-31.04			
Control violence	19	1.39	0.00-14.94	665	.81	-0.02
No Control violence	94	2.45	0.00-31.04			
Cuddled	12	1.37	0.00-8.26	518	.41	-0.08
No Cuddled	101	2.41	0.00-31.04			
Disguise	5	8.06	0.33-12.57	150	.09	-0.16
No Disguise	108	1.72	0.00-31.04			
Ejaculated	43	1.45	0.00-17.00	1216	.09	-0.02
No Ejaculated	70	3.43	0.06-31.04			
Erectile dysfunction	10	5.24	0.75-14.29	388	.20	-0.12
No Erectile dysfunction	103	1.76	0.00-31.04			
Excused or justified	43	1.46	0.00-17.00	144	.00	-0.25
No Excused or justified	70	3.43	0.06-31.04		7	
Fellatio	54	1.18	0.00-29.32	1236	.04	-0.19
No Fellatio	59	4.10	0.00-31.04			
Gagged hand	15	1.28	0.17-31.04	657	.51	-0.06
No Gagged hand	98	2.23	0.00-29.32			
Implied knowing	7	1.35	0.40-21.07	364	.93	-0.01
No Implied knowing	106	2.21	0.00-31.04			
Kissed	42	2.02	0.00-29.32	1486	.98	-0.04
No Kissed	71	2.02	0.00-31.04			
Locked in	11	4.10	0.40-14.29	5736	.45	-0.07
No Locked in	102	1.73	0.00-31.04			
Masturbation hand	7	1.61	0.21-9.56	347	.78	-0.03
No Masturbation hand	106	2.21	0.00-31.04			
Non sexual questions	26	1.53	0.00-14.94	1013	.42	-0.08
No Non sexual questions	87	2.46	0.00-31.04			
Ordered no look	12	3.74	0.06-8.06	571	.74	-0.03
No Ordered no look	101	1.76	0.00-31.04			

Appendix 28: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Individual offence behaviours

Behaviour	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Ordered no noise	48	1.36	0.06-21.07	1296	.13	-0.14
No Ordered no noise	65	2.59	0.00-31.04			
Ordered no report	17	2.75	0.09-14.29	774	.74	-0.03
No Ordered no report	96	1.89	0.00-31.04			
Ordered property	30	3.50	0.06-29.32	1030	.16	-0.13
No Ordered property	83	1.66	0.00-31.04			
Ordered redress	10	3.43	0.06-14.29	443	.47	-0.07
No Ordered redress	103	2.02	0.00-31.04			
Ordered sexual activity	62	1.42	0.00-29.32	1303	.11	-0.15
No Ordered sexual activity	51	2.59	0.09-31.04			
Ordered wait escape	7	4.10	0.21-29.32	334	.75	-0.03
No Ordered wait escape	106	1.73	0.00-31.04			
Ordered undress	19	1.70	0.06-12.57	749	.27	-0.10
No Ordered undress	94	2.21	0.00-31.04			
Penis testicles public hair touched	11	1.11	0.00-10.58	432	.21	-0.12
No Penis testicles public hair touched	102	2.42	0.00-31.04			
Physical violence	40	2.02	0.15-29.32	1444	.92	-0.01
No Physical violence	73	2.01	0.00-31.04			
Rummaged	15	2.71	0.09-29.32	555	.13	-0.14
No Rummaged	98	1.68	0.00-31.04			
Sat or laid beside victim	7	1.12	0.12-8.26	296	.37	-0.08
No Sat Laid	106	2.42	0.00-31.04			
Sat or laid beside victim	7	1.12	0.00-8.32	298	.35	-0.09
No Sat Laid	108	1.68	0.00-31.04			
Self disclosure criminal	12	0.76	0.00-7.37	335	.01	-0.24
No Self disclosure criminal	101	2.57	0.00-31.04			
Self disclosure personal	33	1.11	0.00-9.56	948	.02	-0.22
No Self disclosure personal	80	2.76	0.00-31.04			
Sexual questions	9	1.11	0.00-7.08	273	.04	-0.19
No Sexual questions	104	2.45	0.00-31.04			
Stole property	52	2.51	0.00-29.32	1545	.81	-0.02
No Stole property	61	1.76	0.00-31.04			

Appendix 29: Descriptive statistics and Mann Whitney U output for Distance to Initial approach location and Individual offence behaviours (continued)

Behaviour	Age			Test output		
	n	Median	Range	*U*	*p*	*r*
Threatened physical violence	38	1.18	0.00-14.94	1083.50	.04	-0.20
No Threatened physical violence	75	2.59	0.00-31.04			
Threatened weapon	27	2.41	0.12-17.00	1115	.76	-0.03
No Threatened weapon	86	1.73	0.00-31.04			
Tobacco smoked	5	4.10	0.86-13.60	198	.32	-0.10
No Tobacco smoked	108	1.89	0.00-31.04			
Tore clothing	11	0.77	0.17-8.06	489	.49	-0.07
No Tore clothing	102	2.42	0.00-31.04			
Vaginal digital	20	1.53	0.00-19.23	912	.89	-0.01
No Vaginal digital	93	2.43	0.00-31.04			
Vaginal penile	81	2.01	0.00-31.04	1216	.61	-0.05
No Vaginal penile	32	2.06	0.00-17.00			
Verbal abuse	16	1.36	0.12-21.07	749	.82	-0.02
No Verbal abuse	97	2.41	0.00-31.04			
Victim arousal	15	1.45	0.06-13.60	610	.29	-0.10
No Victim arousal	98	2.42	0.00-31.04			
Weapon from scene	10	1.36	0.15-5.49	396	.23	-0.11
No Weapon from scene	103	2.41	0.00-31.04			
Weapon to scene	27	5.02	0.06-29.32	932	.12	-0.14
No Weapon to scene	86	1.62	0.00-31.04			

Appendix 30: Descriptive statistics and Kruskal Wallis output for Distance to Crime location and Geo-mobility style

Geo-mobility style	Distance (in km)			Test output	
	n	Median	Range	χ^2	*p*
Intruded	17	5.02	0.09-29.32	4.62	.20
Ambushed	28	1.12	0.00-31.04		
Abducted	57	1.66	0.00-21.07		
Followed	13	1.82	0.35-8.32		

Appendix 31: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Initial approach location type

Location type	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	27	4.24	0.09-29.32	1480	.05	0.18
Outdoors	88	1.48	0.00-31.04			

Appendix 32: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Attack location type

Location type	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	27	2.77	0.09-29.32	1424	.12	0.15
Outdoors	88	1.49	0.00-31.04			

Appendix 33: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Crime location type

Location type	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	41	1.31	0.00-29.32	1326	.27	-0.10
Outdoors	74	2.13	0.00-31.04			

Appendix 34: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Victim release location type

Location type	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	43	1.50	0.00-29.32	1552	.98	0.00
Outdoors	72	1.76	0.00-31.04			

Appendix 35: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Transportation type

Transportation	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Foot	108	1.51	0.00-31.04	299	.36	-0.09
No Foot	7	2.26	0.96-15.61			

Appendix 36: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Individual offence behaviours

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Anal penile	22	1.51	0.00-14.29	944.50	.58	-0.05
No Anal penile	93	1.70	0.00-31.04			
Apologised	6	1.22	0.33-7.93	317	.90	-0.01
No Apologised	109	1.66	0.00-31.04			
Bit	7	2.75	0.81-14.29	266	.19	-0.12
No Bit	108	1.51	0.00-31.04			
Blindfolded material	11	2.46	0.14-13.11	538	.75	-0.03
No Blindfolded material	104	1.59	0.00-31.04			
Breasts	11	0.81	0.00-14.29	430	.18	-0.13
No Breasts	104	1.75	0.00-31.04			
Condom	19	1.31	0.00-15.61	728	.17	-0.13
No Condom	96	1.76	0.00-31.04			
Complimented	12	1.29	0.00-7.34	489.50	.24	-0.11
No Complimented	103	1.82	0.00-31.04			
Control violence	19	1.31	0.00-15.61	713.50	.76	-0.02
No Control violence	96	1.76	0.00-31.04			
Cuddled	12	1.12	0.00-8.32	438	.10	-0.16
No Cuddled	103	1.81	0.00-31.04			
Disguise	6	4.45	0.00-9.56	308.50	.82	-0.02
No Disguise	109	1.61	0.00-31.04			
Ejaculated	44	1.38	0.00-17.00	1287	.11	-0.15
No Ejaculated	71	1.99	0.00-31.04			
Erectile dysfunction	10	5.24	0.35-14.29	392	.19	-0.12
No Erectile dysfunction	105	1.56	0.00-31.04			
Excused or justified	44	1.38	0.00-17.00	171	.02	-0.23
No Excused or justified	71	1.99	0.00-31.04			
Fellatio	55	1.29	0.00-29.32	2721	.21	-0.12
No Fellatio	60	2.43	0.00-31.04			
Gagged hand	15	1.13	0.00-29.32	700.50	.68	-0.04
No Gagged hand	100	1.63	0.00-29.32			
Implied knowing	7	1.56	0.00-21.07	358.50	.82	-0.02
No Implied knowing	108	1.63	0.00-31.04			
Kissed	42	1.29	0.00-29.32	1385	.39	-0.08
No Kissed	73	1.82	0.00-31.04			
Locked in	11	2.64	0.00-14.29	5981	.63	-0.04
No Locked in	104	1.59	0.00-31.04			
Masturbation hand	7	1.61	0.21-9.56	370	.93	-0.01
No Masturbation hand	108	1.61	0.00-31.04			
Non sexual questions	26	1.59	0.00-15.61	1152	.97	-0.00
No Non sexual questions	89	1.70	0.00-31.04			
Ordered no noise	48	1.12	0.00-21.07	1321	.10	-0.15
No Ordered no noise	67	2.43	0.00-31.04			

Appendix 36: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Individual offence behaviours (continued)

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Ordered no look	12	3.74	0.14-8.06	597	.85	-0.02
No Ordered no look	103	1.56	0.00-31.04			
Ordered no report	17	1.32	0.00-14.29	781	.68	-0.04
No Ordered no report	98	1.68	0.00-31.04			
Ordered property	30	3.50	0.09-29.32	943	.03	-0.20
No Ordered property	85	1.46	0.00-31.04			
Ordered redress	10	1.12	0.00-14.29	455	.49	-0.07
No Ordered redress	105	1.70	0.00-31.04			
Ordered sexual activity	63	1.29	0.00-29.32	1346.	.11	-0.15
No Ordered sexual activity	52	2.43	0.00-31.04	50		
Ordered wait escape	7	2.46	0.21-29.32	366	.89	-0.01
No Ordered wait escape	108	1.59	0.00-31.04			
Ordered undress	19	0.34	0.00-10.56	558	.008	-0.25
No Ordered undress	96	2.13	0.00-31.04			
Penis testicles public hair touched	11	1.11	0.00-10.56	489.5	.43	-0.07
No Penis testicles public hair touched	104	1.68	0.00-31.04	0		
Physical violence	40	1.59	0.00-29.32	1441	.73	-0.03
No Physical violence	75	1.66	0.00-31.04			
Rummaged	15	2.69	0.09-29.32	507	.04	-0.19
No Rummaged	100	1.48	0.00-31.04			
Sat or laid beside victim	7	1.12	0.00-8.32	298	.35	-0.09
No Sat Laid	108	1.68	0.00-31.04			
Self disclosure criminal	12	0.56	0.00-7.70	373	.03	-0.21
No Self disclosure criminal	103	1.99	0.00-31.04			
Self disclosure personal	33	0.77	0.00-9.56	938	.01	-0.24
No Self disclosure personal	82	2.45	0.00-31.04			
Sexual questions	9	1.11	0.00-7.34	335.50	.14	-0.14
No Sexual questions	106	1.76	0.00-31.04			
Stole property	52	2.05	0.00-29.32	1452.50	.30	-0.10
No Stole property	63	1.53	0.00-31.04			
Threatened physical violence	38	1.10	0.00-15.61	1237.50	.18	-0.12
No Threatened physical violence	77	1.99	0.00-31.04			
Threatened weapon	28	1.46	0.00-17.00	1192.50	.87	-0.02
No Threatened weapon	87	1.66	0.00-31.04			
Tobacco smoked	5	1.46	0.59-13.60	227	.51	-0.06
No Tobacco smoked	110	1.63	0.00-31.04			
Tore clothing	11	0.77	0.00-8.06	493	.46	-0.07
No Tore clothing	104	1.68	0.00-31.04			
Vaginal digital	20	1.59	0.00-19.76	916.50	.81	-0.02
No Vaginal digital	95	1.66	0.00-31.04			
Vaginal penile	82	1.63	0.00-31.04	1339.50	.93	-0.01
No Vaginal penile	33	1.50	0.00-17.00			

Appendix 36: Descriptive statistics and Mann Whitney U output for Distance to Crime location and Individual offence behaviours (continued)

		Distance (in km)		Test output		
	n	Median	Range	*U*	*p*	*r*
Verbal abuse	16	2.16	0.00-21.07	732.50	.63	-0.04
No Verbal abuse	99	1.56	0.00-31.04			
Victim arousal	15	1.46	0.09-13.60	690	.62	-0.05
No Victim arousal	100	1.68	0.00-31.04			
Weapon from scene	10	1.20	0.00-5.43	394.50	.20	-0.12
No Weapon from scene	105	1.70	0.00-31.04			
Weapon to scene	28	3.61	0.00-29.32	995	.15	-0.14
No Weapon to scene	87	1.50	0.00-31.04			

Appendix 37: Percentages and Chi-Square output for Burglary offences v. Geo-mobility style

	Burglary Offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 16.7% No Intruded: 83.8%	Intruded: 13.7% No Intruded: 86.3%	0.85	.84	0.08
Ambushed	Ambushed: 27.8% No Ambushed: 72.2%	Ambushed: 22.1% No Ambushed: 77.9%			
Abducted	Abducted: 44.4% No Abducted: 55.6%	Abducted: 50.5% No Abducted: 49.5%			
Followed	Followed: 11.1% No Followed: 88.9%	Followed: 13.7% No Followed: 86.3%			

Appendix 38: Percentages and Chi-Square output for Burglary offences and Location type

Location Type	Burglary offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 30.6% Outdoors: 69.4%	Indoors: 18.9% Outdoors: 81.8%	2.04	.15	-0.13
Attack	Indoors: 22.2% Outdoors: 77.8%	Indoors: 25.3% Outdoors: 74.7%	0.13	.72	0.04
Crime	Indoors: 33.3% Outdoors: 66.7%	Indoors: 37.9% Outdoors: 62.1%	0.23	.63	0.04
Victim release	Indoors: 33.3% Outdoors: 66.7%	Indoors: 40.0% Outdoors: 60.0%	0.49	.48	0.06

Appendix 39: Percentages and Chi-Square output for Burglary offences v. Transportation type

Variable	Burglary offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 97.2% No Foot: 2.8%	Foot: 90.5% No Foot: 9.5%	1.66	.20	0.11

Appendix 40: Percentages and Chi-Square output for Burglary offences and Individual offence behaviours

Behaviour	Burglary offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	22.2	16.8	0.51	.48	0.06
No Anal penile	77.8	83.2			
Apologised	5.6	4.2	0.11	.74	0.03
No Apologised	94.4	95.8			
Bit	11.1	4.2	0.14	.21	0.13
No Bit	88.9	95.8			
Blindfolded material	8.3	8.4	0.00	.99	0.00
No Blindfolded material	91.7	91.6			
Breasts	11.1	10.5	0.01	.92	0.01
No Breasts	88.9	89.5			
Complimented	8.3	10.5	0.14	.71	-0.03
No Complimented	91.7	89.5			
Condom	13.9	18.9	0.46	.50	-0.06
No Condom	86.1	81.8			
Control violence	88.9	86.3	0.15	.70	0.03
No Control violence	11.1	13.7			
Cuddled	13.9	7.4	1.33	.25	0.10
No Cuddled	86.1	92.6			
Disguise	13.9	1.1		.006	0.27
No Disguise	86.1	98.9			
Ejaculated	36.1	37.9	0.04	.85	-0.02
No Ejaculated	63.9	62.1			
Erectile dysfunction	8.3	9.5	0.04	.84	-0.02
No Erectile dysfunction	91.7	90.5			
Excused or justified	11.1	3.2	3.27	.07	0.16
No Excused or justified	88.9	96.8			
Fellatio	50.0	42.1	0.66	.42	0.07
No Fellatio	50.0	57.9			
Gagged hand	16.7	12.6	0.36	.55	0.05
No Gagged hand	83.3	87.4			
Implied knowing	5.6	7.4	0.13	.71	-0.03
No Implied knowing	94.4	92.6			
Kissed	38.9	36.8	0.05	.83	0.02
No Kissed	61.1	63.2			
Locked in	5.6	10.5	0.78	.38	-0.08
No Locked in	94.4	89.5			
Masturbation hand	8.3	4.2	0.88	.35	0.08
No Masturbation hand	91.7	95.8			
Non sexual questions	16.7	21.1	0.32	.57	-0.05
No Non sexual questions	83.3	78.9			
Ordered no noise	38.9	43.2	0.20	.66	-0.04
No Ordered no noise	61.1	56.8			
Ordered no look	8.3	9.5	0.04	.84	-0.02
No Ordered no look	91.7	90.5			

Appendix 40: Percentages and Chi-Square output for Burglary offences and Individual offence behaviours (continued)

Behaviour	Burglary offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no report	16.7	12.6	0.36	.55	0.05
No Ordered no report	83.3	87.4			
Ordered property	36.1	17.9	4.91	.03	0.19
No Ordered property	63.9	82.1			
Ordered redress	11.1	7.4	0.48	.49	0.06
No Ordered redress	88.9	92.6			
Ordered sexual activity	58.3	50.5	0.64	.42	0.07
No Ordered sexual activity	41.7	49.5			
Ordered wait escape	5.6	5.3	0.00	.95	0.01
No Ordered wait escape	94.4	94.7			
Ordered undress	25.0	12.6	2.97	.09	0.15
No Ordered undress	75.0	87.4			
Penis testicles public hair touched	13.9	7.4	1.33	.25	0.10
No Penis testicles public hair touched	86.1	92.6			
Physical violence	38.9	34.7	0.20	.66	0.04
No Physical violence	61.1	65.3			
Rummaged	19.4	11.6	1.36	.24	0.10
No Rummaged	80.6	88.4			
Sat or laid beside victim	8.3	4.2	0.88	.35	0.08
No Sat Laid	91.7	95.8			
Self disclosure criminal	13.9	8.4	0.87	.35	0.08
No Self disclosure criminal	86.1	91.6			
Self disclosure personal	41.7	23.2	4.41	.04	0.18
No Self disclosure personal	58.3	76.8			
Sexual questions	11.1	5.3	1.40	.28	0.10
No Sexual questions	88.9	94.7			
Stole property	44.4	44.2	0.00	.98	0.00
No Stole property	55.6	55.8			
Threatened physical violence	38.9	27.4	1.63	.20	0.11
No Threatened physical violence	61.6	72.6			
Threatened weapon	33.3	20.0	2.57	.11	0.14
No Threatened weapon	66.7	80.0			
Tobacco smoked	5.6	4.2		.67	0.03
No Tobacco smoked	94.4	95.8			
Tore clothing	5.6	11.6	1.06	.30	-0.09
No Tore clothing	94.4	88.4			
Vaginal digital	25.0	13.7	2.39	.12	-0.14
No Vaginal digital	75.0	86.3			

Appendix 40: Percentages and Chi-Square output for Burglary offences and Individual offence behaviours (continued)

Behaviour	Burglary offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Vaginal penile	80.6	69.5	1.61	.21	0.11
No Vaginal penile	19.4	30.5			
Verbal abuse	19.4	9.5	2.42	.12	0.14
No Verbal abuse	80.6	90.5			
Victim arousal	8.3	12.6	0.48	.49	-0.06
No Victim arousal	91.7	87.4			
Weapon from scene	8.3	8.4	0.00	.99	0.00
No Weapon from scene	91.7	91.6			
Weapon to scene	30.6	22.1	1.01	.32	0.09
No Weapon to scene	69.4	77.9			

Appendix 41: Percentages and Chi-Square output for Criminal damage offences v. Abducted

Variable	Criminal Damage Offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Abducted	Abducted: 22.4% No abducted: 77.6%	Abducted: 21.9% No abducted: 78.1%	0.01	.94	-0.01

Appendix 42: Percentages and Chi-Square output for Criminal damage offences and Location type

Location type	Criminal damage offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 27.6% Outdoors: 72.4%	Indoors: 20.6% Outdoors: 79.4%	0.64	.42	-0.07
Attack	Indoors: 27.6% Outdoors: 72.4%	Indoors: 23.5% Outdoors: 76.5%	0.20	.65	-0.04
Crime	Indoors: 31.0% Outdoors: 69.0%	Indoors: 38.2% Outdoors: 61.8%	0.50	.48	0.06
Victim release	Indoors: 34.5% Outdoors: 65.5%	Indoors: 39.2% Outdoors: 60.8%	0.21	.64	0.04

Appendix 43: Percentages and Chi-Square output for Criminal damage offences v. Transportation

Variable	Criminal damage offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 96.6% No Foot: 3.4%	Foot: 91.2 % No Foot: 8.8%	0.93	.34	0.08

Appendix 44: Percentages and Chi-Square output for Criminal damage offences and Individual offence behaviours

Behaviour	Criminal damage offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	13.8	19.6	0.51	.48	-0.06
No Anal penile	86.2	80.4			
Apologised	3.4	4.9	0.11	.74	-0.03
No Apologised	96.6	95.1			
Bit	0	7.8	2.42	.12	-0.14
No Bit	100	92.2			
Blindfolded material	3.4	9.8	1.19	.28	-0.10
No Blindfolded material	96.6	90.2			
Breasts	6.9	11.8	0.56	.45	-0.07
No Breasts	93.1	88.2			
Complimented	6.9	10.8	0.38	.54	-0.05
No Complimented	93.1	89.2			
Condom	17.2	17.6	0.00	.96	0.00
No Condom	82.8	82.4			
Control violence	82.8	88.2	0.60	.44	-0.07
No Control violence	17.2	11.8			
Cuddled	13.8	7.8	0.96	.33	0.09
No Cuddled	86.2	92.2			
Disguise	13.8	2.0		.02	0.24
No Disguise	86.2	98.0			
Ejaculated	20.7	42.2	4.44	.04	-0.18
No Ejaculated	79.3	57.8			
Erectile dysfunction	10.3	8.8	0.06	.80	0.02
No Erectile dysfunction	89.7	91.2			
Excused or justified	13.8	2.9	5.26	.02	0.20
No Excused or justified	86.2	97.1			
Fellatio	37.9	46.1	0.61	.44	-0.07
No Fellatio	62.1	53.9			
Gagged hand	20.7	11.8	1.52	.22	0.11
No Gagged hand	79.3	88.2			
Implied knowing	6.9	6.9	0.00	1.00	0.00
No Implied knowing	93.1	93.1			
Kissed	37.9	37.3	0.00	.95	0.01
No Kissed	62.1	62.7			
Locked in	3.4	10.8	1.46	.23	-0.11
No Locked in	96.6	89.2			
Masturbation hand	0	6.9	2.10	.15	-0.13
No Masturbation hand	100	93.1			
Non sexual questions	13.8	21.6	0.86	.35	-0.08
No Non sexual questions	86.2	78.4			
Ordered no noise	48.3	40.2	0.61	.44	0.07
No Ordered no noise	51.7	59.8			
Ordered no look	10.3	8.8	0.06	.80	0.02
No Ordered no look	89.7	91.2			

Appendix 44: Percentages and Chi-Square output for Criminal damage offences and Individual offence behaviours (continued)

Behaviour	Criminal damage offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no report	10.3	14.7	0.36	.55	-0.05
No Ordered no report	89.7	85.3			
Ordered property	31.0	20.6	1.40	.24	0.10
No Ordered property	69.0	79.4			
Ordered redress	6.9	8.8	0.11	.74	-0.03
No Ordered redress	93.1	91.2			
Ordered sexual activity	55.2	52.0	0.09	.76	0.03
No Ordered sexual activity	44.8	48.0			
Ordered wait escape	10.3	3.9	1.84	.18	0.12
No Ordered wait escape	89.7	96.1			
Ordered undress	31.0	11.8	6.23	.01	0.22
No Ordered undress	69.0	88.2			
Penis testicles public hair touched	10.3	8.8	0.06	.80	0.02
No Penis testicles public hair touched	89.7	91.2			
Physical violence	37.9	35.3	0.07	.79	0.02
No Physical violence	62.1	64.7			
Rummaged	13.8	13.7	0.00	.99	0.00
No Rummaged	86.2	86.3			
Sat or laid beside victim	3.4	5.9	0.26	.61	-0.05
No Sat Laid	96.6	94.1			
Self disclosure criminal	6.9	10.8	0.38	.54	-0.05
No Self disclosure criminal	93.1	89.2			
Self disclosure personal	41.4	24.5	3.17	.08	0.16
No Self disclosure personal	58.6	75.5			
Sexual questions	6.9	6.9	0.00	1	0.00
No Sexual questions	93.1	93.1			
Stole property	44.8	44.1	0.01	.95	0.01
No Stole property	55.2	55.9			
Threatened physical violence	31.0	30.4	0.00	.95	0.01
No Threatened physical violence	69.0	69.6			
Threatened weapon	31.0	21.6	1.12	.29	0.09
No Threatened weapon	69.0	78.4			
Tobacco smoked	6.9	3.9		.61	0.06
No Tobacco smoked	93.1	96.1			

Appendix 44: Percentages and Chi-Square output for Criminal damage offences and Individual offence behaviours (continued)

Behaviour	Criminal damage offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Tore clothing	13.8	8.8	0.62	.43	0.07
No Tore clothing	86.2	91.2			
Vaginal digital	20.7	15.7	0.41	.53	0.06
No Vaginal digital	79.3	84.3			
Vaginal penile	72.4	72.5	0.00	.99	0.00
No Vaginal penile	27.6	27.5			
Verbal abuse	13.8	11.8	0.09	.77	0.03
No Verbal abuse	86.2	88.2			
Victim arousal	6.9	12.7	0.76	.38	-0.08
No Victim arousal	93.1	87.3			
Weapon from scene	6.9	8.8	0.11	.74	-0.03
No Weapon from scene	93.1	91.2			
Weapon to scene	20.7	25.5	0.28	.60	-0.05
No Weapon to scene	79.3	74.5			

Appendix 45: Percentages and Chi-Square output for Drugs offences v. Geo-mobility style

Variable	Drugs offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 12.2% No Intruded: 87.8%	Intruded: 15.6% No Intruded: 84.4%	3.69	.30	0.17
Ambushed	Ambushed: 14.6% No Ambushed: 85.4%	Ambushed: 27.8% No Ambushed: 72.2%			
Abducted	Abducted: 56.1% No Abducted: 43.9%	Abducted: 45.6% No Abducted: 54.4%			
Followed	Followed: 17.1% No Followed: 82.9%	Followed: 11.1% No Followed: 88.9%			

Appendix 46: Percentages and Chi-Square output for Drugs offences and Location type

Location Type	Drugs offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 19.5% Outdoors: 80.5%	Indoors: 23.3% Outdoors: 76.7%	0.24	.63	0.04
Attack	Indoors: 19.5% Outdoors: 80.5%	Indoors: 26.7% Outdoors: 73.7%	0.78	.38	0.08
Crime	Indoors: 39.0% Outdoors: 61.0%	Indoors: 35.6% Outdoors: 64.4%	0.15	.70	-0.03
Victim release	Indoors: 34.1% Outdoors: 65.9%	Indoors: 40.0% Outdoors: 60.0%	0.41	.52	0.06

Appendix 47: Percentages and Chi-Square output for Drugs offences v. Transportation

Variable	Drugs offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 92.7% No Foot: 7.3%	Foot: 92.2 % No Foot: 7.8%	0.01	.27	0.01

Appendix 48: Percentages and Chi-Square output for Drugs offences and Individual offence behaviours

Behaviour	Drugs offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	9.8	22.2	2.93	.09	-0.15
No Anal penile	90.2	77.8			
Apologised	7.3	3.3		.38	0.09
No Apologised	92.7	96.7			
Bit	4.9	6.7	0.16	.69	-0.04
No Bit	95.1	93.3			
Blindfolded material	9.8	7.8	0.14	.71	0.03
No Blindfolded material	90.2	92.2			
Breasts	7.3	12.2	0.71	.40	-0.07
No Breasts	92.7	87.8			
Complimented	7.3	11.1	0.45	.50	-0.06
No Complimented	92.7	88.9			
Condom	19.5	16.7	0.16	.69	0.04
No Condom	80.5	83.3			
Control violence	92.7	84.4	1.69	.19	0.11
No Control violence	7.3	15.6			
Cuddled	12.2	7.8	0.66	.42	0.07
No Cuddled	87.8	92.2			
Disguise	7.3	3.3		.38	0.09
No Disguise	92.7	96.7			
Ejaculated	43.9	34.4	1.08	.30	0.09
No Ejaculated	56.1	65.6			
Erectile dysfunction	9.8	8.9	0.03	.87	0.01
No Erectile dysfunction	90.2	91.1			
Excused or justified	9.8	3.3		.20	0.13
No Excused or justified	90.2	96.7			
Fellatio	51.2	41.4	1.17	.28	0.09
No Fellatio	48.8	58.9			
Gagged hand	17.1	12.2	0.56	.46	0.07
No Gagged hand	82.9	87.8			
Implied knowing	7.3	6.7	0.02	.89	0.01
No Implied knowing	92.7	93.3			
Kissed	34.1	38.9	0.27	.60	-0.05
No Kissed	65.9	61.6			
Locked in	12.2	7.8	0.66	.42	0.07
No Locked in	87.8	92.2			
Masturbation hand	2.4	6.7		.43	-0.09
No Masturbation hand	97.6	93.3			

Appendix 48: Percentages and Chi-Square output for Drugs offences and Individual offence behaviours (continued)

Behaviour	Drugs offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no noise	43.9	41.1	0.09	.76	0.03
No Ordered no noise	56.1	58.9			
Ordered no look	9.8	8.9	0.03	.87	0.01
No Ordered no look	90.2	91.1			
Ordered no report	17.1	12.2	0.56	.46	0.07
No Ordered no report	82.9	87.8			
Ordered property	22.0	23.3	0.03	.86	-0.02
No Ordered property	78.0	76.7			
Ordered redress	2.4	11.1	2.75	.10	-0.15
No Ordered redress	97.6	88.9			
Ordered sexual activity	53.7	52.2	0.02	.88	0.01
No Ordered sexual activity	46.3	47.8			
Ordered wait escape	9.8	3.3		.20	0.13
No Ordered wait escape	90.2	96.7			
Ordered undress	22.0	13.3	1.55	.21	0.11
No Ordered undress	78.0	86.7			
Non sexual questions	22.0	18.9	0.17	.68	0.04
No Non sexual questions	78.0	81.1			
Penis testicles public hair touched	12.2	7.8	0.66	.42	0.07
No Penis testicles public hair touched	87.8	92.2			
Physical violence	39.0	34.4	0.26	.61	0.04
No Physical violence	61.0	65.6			
Rummaged	9.8	15.6	0.80	.37	-0.08
No Rummaged	90.2	84.4			
Sat or laid beside victim	0	7.8		.10	-0.16
No Sat Laid	100	92.2			
Self disclosure criminal	12.2	8.9	0.34	.56	0.05
No Self disclosure criminal	87.8	91.1			
Self disclosure personal	36.6	24.4	2.05	.15	0.13
No Self disclosure personal	63.4	75.6			
Sexual questions	9.8	5.6	0.78	.38	0.08
No Sexual questions	90.2	94.4			
Stole property	48.8	42.2	0.49	.48	0.06
No Stole property	51.2	57.8			
Threatened physical violence	24.4	33.3	1.06	.30	-0.09
No Threatened physical violence	75.6	66.7			

Appendix 48: Percentages and Chi-Square output for Drugs offences and Individual offence behaviours (continued)

Behaviour	Drugs offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Threatened weapon	31.7	20.0	2.14	.14	0.13
No Threatened weapon	68.3	80.0			
Tobacco smoked	2.4	5.6		.67	-0.07
No Tobacco smoked	97.6	94.4			
Tore clothing	12.2	8.9	0.34	.56	0.05
No Tore clothing	87.8	91.1			
Vaginal digital	22.0	14.4	1.14	.29	0.09
No Vaginal digital	78.0	85.6			
Vaginal penile	73.2	72.2	0.01	.91	0.01
No Vaginal penile	26.8	27.8			
Verbal abuse	19.5	8.9	2.97	.09	0.15
No Verbal abuse	80.5	91.			
Victim arousal	2.4	15.6	4.78	.03	-0.19
No Victim arousal	97.6	84.4			
Weapon from scene	9.8	7.8	0.14	.71	0.03
No Weapon from scene	90.2	92.2			
Weapon to scene	29.3	22.2	0.76	.38	0.08
No Weapon to scene	70.7	77.8			

Appendix 49: Percentages and Chi-Square output for Fraud offence v. Intruded style

Variable	Fraud offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 33.3% No Intruded: 66.7%	Intruded: 13.1% No Intruded: 86.9%	2.76	.10	.15

Appendix 50: Percentages and Chi-Square output for Fraud offences and Location type

Location type	Fraud offence		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 33.3% Outdoors: 66.7%	Indoors: 21.3% Outdoors: 78.7%	0.70	.40	0.07
Attack	Indoors: 33.3% Outdoors: 66.7%	Indoors: 23.8% Outdoors: 76.2%	0.42	.52	0.06
Crime	Indoors: 44.4% Outdoors: 55.6%	Indoors: 36.1% Outdoors: 63.9%	0.25	.62	0.04
Victim release	Indoors: 44.4% Outdoors: 55.6%	Indoors: 37.7% Outdoors: 62.3%	0.16	.69	0.04

Appendix 51: Percentages and Chi-Square output for Fraud offence v. Transportation

Variable	Fraud offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 88.9% No Foot: 11.1%	Foot: 92.6% No Foot: 7.4%	0.17	.68	-0.04

Appendix 52: Percentages and Chi-Square output for Fraud offences and Individual offence behaviours

Behaviour	Fraud offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	22.2	18.0	0.10	.75	0.03
No Anal penile	77.8	82.0			
Apologised	11.1	4.1	0.94	.33	0.09
No Apologised	88.9	95.9			
Bit	22.2	4.9	4.38	.04	0.18
No Bit	77.8	95.1			
Blindfolded material	0	9.0	0.89	.35	-0.08
No Blindfolded material	100	91.0			
Breasts	0	11.5	1.16	.28	-0.09
No Breasts	100	88.5			
Complimented	11.1	9.8	0.02	.90	0.01
No Complimented	88.9	90.2			
Condom	33.3	16.4	1.66	.20	0.11
No Condom	66.7	83.6			
Control violence	77.8	87.7	0.73	.39	-0.08
No Control violence	22.2	12.3			
Cuddled	0	9.8	0.98	.32	-0.09
No Cuddled	100	90.2			
Disguise	22.2	3.3	6.88	.009	0.23
No Disguise	77.8	96.7			
Ejaculated	44.4	36.9	0.21	.65	0.04
No Ejaculated	55.6	63.1			
Erectile dysfunction	11.1	9.0	0.04	.83	0.02
No Erectile dysfunction	88.9	91.0			

Appendix 52: Percentages and Chi-Square output for Fraud offences and Individual offence behaviours (continued)

Behaviour	Fraud offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Excused or justified	22.2	4.1	5.44	.02	0.20
No Excused or justified	77.8	95.9			
Fellatio	33.3	45.1	0.47	.49	-0.06
No Fellatio	66.7	54.9			
Gagged hand	11.1	13.9	0.06	.81	-0.02
No Gagged hand	88.9	86.1			
Implied knowing	0	7.4	0.71	.40	-0.07
No Implied knowing	100	92.6			
Kissed	44.4	36.9	0.21	.65	0.04
No Kissed	55.6	63.1			
Locked in	11.1	9.0	0.04	.83	0.02
No Locked in	88.9	91.0			
Masturbation hand	11.1	4.9	0.64	.43	0.07
No Masturbation hand	88.9	95.1			
Non sexual questions	55.6	17.2	7.75	.005	0.24
No Non sexual questions	44.4	82.8			
Ordered no noise	33.3	42.6	0.30	.59	-0.05
No Ordered no noise	66.7	57.4			
Ordered no look	22.2	8.2	1.98	.16	0.12
No Ordered no look	77.8	91.8			
Ordered no report	22.2	13.1	0.59	.44	0.07
No Ordered no report	77.8	86.9			
Ordered property	55.6	20.5	5.84	.02	0.21
No Ordered property	44.4	79.5			
Ordered redress	22.2	7.4	2.40	.12	0.14
No Ordered redress	77.8	92.6			
Ordered sexual activity	33.3	54.1	1.45	.31	-0.11
No Ordered sexual activity	66.7	45.9			
Ordered wait escape	22.2	4.1	5.44	.02	0.20
No Ordered wait escape	77.8	95.9			
Ordered undress	44.4	13.9	5.80	.02	0.21
No Ordered undress	55.6	86.1			
Penis testicles public hair touched	0	9.8	0.98	.32	-0.09
No Penis testicles public hair touched	100	90.2			
Physical violence	44.4	35.2	0.31	.58	0.05
No Physical violence	55.6	64.8			
Rummaged	33.3	12.3	3.13	.08	0.16
No Rummaged	66.7	87.7			
Sat or laid beside victim	0	5.7	0.55	.46	-0.07
No Sat Laid	100	94.3			

Appendix 52: Percentages and Chi-Square output for Fraud offences and Individual offence behaviours (continued)

Behaviour	Fraud offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Self disclosure criminal	0	10.7	1.07	.30	-0.09
No Self disclosure criminal	100	89.3			
Self disclosure personal	33.3	27.9	0.12	.73	0.03
No Self disclosure personal	66.7	72.1			
Sexual questions	22.2	5.7	3.56	.06	0.17
No Sexual questions	77.8	94.3			
Stole property	77.8	41.8	4.40	.04	0.18
No Stole property	22.2	58.2			
Threatened physical violence	44.4	29.5	0.88	.35	0.08
No Threatened physical violence	55.6	70.5			
Threatened weapon	11.1	24.6	0.84	.36	-0.08
No Threatened weapon	88.9	75.4			
Tobacco smoked	0	4.9	0.46	.50	-0.06
No Tobacco smoked	100	95.1			
Tore clothing	0	10.7	1.07	.30	-0.09
No Tore clothing	100	89.3			
Vaginal digital	11.1	17.2	0.22	.64	-0.04
No Vaginal digital	88.9	82.8			
Vaginal penile	88.9	71.3	1.30	.25	0.10
No Vaginal penile	11.1	28.7			
Verbal abuse	11.1	12.3	0.01	.92	0.00
No Verbal abuse	88.9	87.7			
Victim arousal	11.1	11.5	0.00	.97	0.00
No Victim arousal	88.9	88.5			
Weapon from scene	0	9.0	0.89	.35	-0.08
No Weapon from scene	100	91.0			
Weapon to scene	44.4	23.0	2.10	.15	0.13
No Weapon to scene	55.6	77.0			

Appendix 53: Percentages and Chi-square output for Motoring offences and Location type

Location Type	Motoring offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 50.0% Outdoors: 50.0%	Indoors: 21.3% Outdoors: 78.7%		.21	0.12
Attack	Indoors: 50.0% Outdoors: 50.0%	Indoors: 23.6% Outdoors: 76.4%		.25	0.11
Crime	Indoors: 50.0% Outdoors: 50.0%	Indoors: 36.2% Outdoors: 63.8%		.62	0.05
Victim release	Indoors: 50.0% Outdoors: 50.0%	Indoors: 37.8% Outdoors: 62.2%		.64	0.04

Appendix 54: Percentages and Chi-Square output for Motoring offences v. Transportation

Variable	Motoring offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 100.0% No Foot: 0.0%	Foot: 92.1% No Foot: 7.9%		1.00	0.05

Appendix 55: Percentages and Chi-Square output for Motoring offences and Individual offence behaviours

Behaviour	Motoring offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	25.0	18.1		.56	0.03
No Anal penile	75.0	81.9			
Apologised	25.0	3.9		.17	0.17
No Apologised	75.0	96.1			
Bit	25.0	5.5		.23	0.14
No Bit	75.0	94.5			
Blindfolded material	25.0	7.9		.30	0.11
No Blindfolded material	75.0	92.1			
Breasts	25.0	10.2		.37	0.08
No Breasts	75.0	89.8			
Complimented	0	10.2		1.00	-0.06
No Complimented	100	89.8			
Condom	0	18.1		-.08	-0.08
No Condom	100	81.9			
Control violence	100	86.6		1.00	0.07
No Control violence	0	13.4			
Cuddled	0	9.4		1.00	-0.06
No Cuddled	100	90.6			
Disguise	25.0	3.9		.17	0.17
No Disguise	75.0	96.1			
Ejaculated	25.0	37.8		1.00	-0.05
No Ejaculated	75.0	62.2			
Erectile dysfunction	0	9.4		1.00	-0.06
No Erectile dysfunction	100	90.6			

Appendix 55: Percentages and Chi-Square output for Motoring offences and Individual offence behaviours (continued)

Behaviour	Motoring offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Excused or justified	25.0	4.7		.20	0.16
No Excused or justified	75.0	95.3			
Fellatio	75.0	43.3		.32	0.11
No Fellatio	25.0	56.7			
Gagged hand	75.0	11.8		.008	0.32
No Gagged hand	25.0	88.2			
Implied knowing	0	7.1		1.00	-0.05
No Implied knowing	100	92.9			
Kissed	50.0	37.0		.63	0.05
No Kissed	50.0	63.0			
Locked in	0	9.4		1.00	-0.06
No Locked in	100	90.6			
Masturbation hand	0	5.5		1.00	-0.04
No Masturbation hand	100	94.5			
Non sexual questions	0	20.5		.58	-0.09
No Non sexual questions	100	79.5			
Ordered no noise	75.0	40.9		.31	0.20
No Ordered no noise	25.0	59.1			
Ordered no look	0	9.4		1.00	-0.06
No Ordered no look	100	90.6			
Ordered no report	0	14.2		1.00	-0.07
No Ordered no report	100	85.8			
Ordered property	50.0	22.0		.23	0.11
No Ordered property	50.0	78.0			
Ordered redress	0	8.7		.38	-0.05
No Ordered redress	100	91.3			
Ordered sexual activity	100	51.2		.12	0.17
No Ordered sexual activity	0	48.8			
Ordered wait escape	25.0	4.7		.20	0.16
No Ordered wait escape	75.0	95.3			
Ordered undress	25.0	15.7		.51	0.04
No Ordered undress	75.0	84.3			
Penis testicles public hair touched	0	9.4		1.00	-0.06
No Penis testicles public hair touched	100	90.6			
Physical violence	75.0	34.6		.13	0.15
No Physical violence	25.0	65.4			
Rummaged	50.0	12.6		.09	0.19
No Rummaged	50.00	87.4			
Sat or laid beside victim	0	5.5		1.00	-0.04
No Sat Laid	100	94.5			

Appendix 55: Percentages and Chi-Square output for Motoring offences and Individual offence behaviours (continued)

Behaviour	Motoring offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Self disclosure criminal	0	10.2		.50	-0.06
No Self disclosure criminal	100	89.8			
Self disclosure personal	75.0	26.8		.07	0.18
No Self disclosure personal	25.0	73.2			
Sexual questions	0	7.1		1.00	-0.05
No Sexual questions	100	92.9			
Stole property	25.0	44.9		.62	-0.07
No Stole property	75.0	55.1			
Threatened physical violence	75.0	29.1		.17	0.05
No Threatened physical violence	25.0	70.9			
Threatened weapon	25.0	23.6		1.00	0.01
No Threatened weapon	75.0	76.4			
Tobacco smoked	0	4.7		1.00	-0.04
No Tobacco smoked	100	95.3			
Tore clothing	0	10.2		.46	-0.06
No Tore clothing	100	89.8			
Vaginal digital	25.0	16.5		.20	0.04
No Vaginal digital	75.0	83.5			
Vaginal penile	75.0	72.4		1.00	0.01
No Vaginal penile	25.0	27.6			
Verbal abuse	0	12.6		1.00	-0.07
No Verbal abuse	100	87.4			
Victim arousal	0	11.8		1.00	-0.06
No Victim arousal	100	88.2			
Weapon from scene	0	8.7		1.00	-0.05
No Weapon from scene	100	91.3			
Weapon to scene	25.0	24.4		1.00	0.00
No Weapon to scene	75.0	75.6			

Appendix 56: Percentages and Chi-Square output for Robbery offences v. Geo-mobility style

Variable	Robbery offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 4.9% No Intruded: 95.1%	Intruded: 18.9% No Intruded: 81.1%	4.91	.18	0.19
Ambushed	Ambushed: 29.3% No Ambushed: 70.7%	Ambushed: 21.1% No Ambushed: 78.9%			
Abducted	Abducted: 53.7% No Abducted: 46.3%	Abducted: 46.7% No Abducted: 53.3%			
Followed	Followed: 12.2% No Followed: 87.8%	Followed: 13.3% No Followed: 86.7%			

Appendix 57: Percentages and Chi-Square output for Robbery offences and Location type

Location type	Robbery offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 14.6% Outdoors: 85.4%	Indoors: 25.6% Outdoors: 74.4%	1.95	.16	0.12
Attack	Indoors: 9.8% Outdoors: 90.2%	Indoors: 31.1% Outdoors: 68.9%	6.96	.01	0.23
Crime	Indoors: 34.1% Outdoors: 65.9%	Indoors: 37.8% Outdoors: 62.2%	0.16	.69	0.04
Victim release	Indoors: 31.7% Outdoors: 68.3%	Indoors: 41.1% Outdoors: 58.9%	1.06	.30	0.09

Appendix 58: Percentages and Chi-Square output for Robbery offences v. Transportation

Variable	Robbery offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 97.6% No Foot: 2.4%	Foot: 90.0 % No Foot: 10.0%	2.28	.13	0.13

Appendix 59: Percentages and Chi-Square output for Robbery offences and Individual offence behaviours

Behaviour	Robbery offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	17.1	18.9	0.06	.80	-0.02
No Anal penile	82.9	81.1			
Apologised	2.4	5.6		.67	-0.07
No Apologised	97.6	94.4			
Bit	7.3	5.6	0.15	.70	0.03
No Bit	92.7	94.4			
Blindfolded material	4.9	10.0	0.96	.33	-0.09
No Blindfolded material	95.1	90.0			
Breasts	4.9	13.3	2.11	.15	-0.13
No Breasts	95.1	86.7			
Complimented	7.3	11.1	0.45	.50	-0.06
No Complimented	92.7	88.9			
Condom	26.8	13.3	3.54	.06	0.16
No Condom	73.2	86.7			
Control violence	87.8	86.7	0.03	.86	0.02
No Control violence	12.2	13.3			
Cuddled	12.2	7.8	0.66	.42	0.07
No Cuddled	87.8	92.2			
Disguise	4.9	4.4	0.01	.91	0.01
No Disguise	95.1	95.6			
Ejaculated	48.8	32.2	3.30	.07	0.16
No Ejaculated	51.2	67.8			
Erectile dysfunction	4.9	11.1	1.32	.25	-0.10
No Erectile dysfunction	95.1	88.9			
Excused or justified	9.8	3.3		.20	0.13
No Excused or justified	90.2	96.7			
Fellatio	48.8	42.2	0.49	.48	0.06
No Fellatio	51.2	57.8			
Gagged hand	4.9	17.8	3.96	.05	-0.17
No Gagged hand	95.1	82.2			
Implied knowing	9.8	5.6	0.78	.38	0.08
No Implied knowing	90.2	94.4			
Kissed	39.0	36.7	0.07	.80	0.02
No Kissed	61.0	63.3			
Locked in	4.9	11.1	1.32	.25	-0.10
No Locked in	95.1	88.9			
Masturbation hand	2.4	6.7		.43	-0.09
No Masturbation hand	97.6	93.3			
Non sexual questions	22.0	18.9	0.17	.68	0.04
No Non sexual questions	78.0	81.1			
Ordered no noise	46.3	40.0	0.47	.50	0.06
No Ordered no noise	53.7	60.0			
Ordered no look	7.3	10.0	0.24	.62	-0.04
No Ordered no look	92.7	90.0			

Appendix 59: Percentages and Chi-Square output for Robbery offences and Individual offence behaviours (continued)

Behaviour	Robbery offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Ordered no report	9.8	15.6	0.80	.37	-0.08
No Ordered no report	90.2	84.4			
Ordered property	29.3	20.0	1.37	.24	0.10
No Ordered property	70.7	80.0			
Ordered redress	7.3	8.9	0.09	.76	-0.03
No Ordered redress	92.7	91.1			
Ordered sexual activity	61.0	48.9	1.65	.20	0.11
No Ordered sexual activity	39.0	51.1			
Ordered wait escape	2.4	6.7		.43	-0.09
No Ordered wait escape	97.6	93.3			
Ordered undress	19.5	14.4	0.54	.46	0.06
No Ordered undress	80.5	85.6			
Penis testicles public hair touched	14.6	6.7	2.15	.14	-0.13
No Penis testicles public hair touched	85.4	93.3			
Physical violence	36.6	35.6	0.01	.91	0.01
No Physical violence	63.4	64.4			
Rummaged	19.5	11.1	1.68	.20	0.11
No Rummaged	80.5	88.9			
Sat or laid beside victim	7.3	4.4		.68	0.06
No Sat Laid	92.7	95.6			
Self disclosure criminal	14.6	7.8	1.48	.22	0.11
No Self disclosure criminal	85.4	92.2			
Self disclosure personal	34.1	25.6	1.03	.31	0.09
No Self disclosure personal	65.9	74.4			
Sexual questions	9.8	5.6	0.78	.38	0.08
No Sexual questions	90.2	94.4			
Stole property	61.0	36.7	6.75	.009	0.23
No Stole property	39.0	63.3			
Threatened physical violence	29.3	31.1	0.05	.83	-0.02
No Threatened physical violence	70.7	68.9			
Threatened weapon	36.6	17.8	5.52	.02	0.21
No Threatened weapon	63.4	82.2			
Tobacco smoked	0	6.7		.18	-0.15
No Tobacco smoked	100	93.3			

Appendix 59: Percentages and Chi-Square output for Robbery offences and Individual offence behaviours (continued)

Behaviour	Robbery offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Tore clothing	7.3	11.1	0.45	.50	-0.06
No Tore clothing	92.7	88.9			
Vaginal digital	19.5	15.6	0.32	57	0.05
No Vaginal digital	80.5	84.4			
Vaginal penile	85.4	66.7	4.94	.03	0.19
No Vaginal penile	14.6	33.3			
Verbal abuse	9.8	13.3	0.34	.56	-0.05
No Verbal abuse	90.2	86.7			
Victim arousal	7.3	13.3	1.01	.32	-0.09
No Victim arousal	92.7	86.7			
Weapon from scene	9.8	7.8	0.14	.71	0.03
No Weapon from scene	90.2	92.2			
Weapon to scene	31.7	21.1	1.71	.19	0.11
No Weapon to scene	68.3	78.9			

Appendix 60: Percentages and Chi-Square output for Sexual offences v. Geo-mobility style

Variable	Sexual Offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 16.2% No Intruded: 83.8%	Intruded: 13.8% No Intruded: 86.2%	0.86	.83	0.08
Ambushed	Ambushed: 24.3% No Ambushed: 75.7%	Ambushed: 23.4% No Ambushed: 76.6%			
Abducted	Abducted: 43.2% No Abducted: 56.8%	Abducted: 51.1% No Abducted: 48.9%			
Followed	Followed: 16.2% No Followed: 83.8%	Followed: 11.7% No Followed: 88.3%			

Appendix 61: Percentages and Chi-Square output for Sexual offences and Location type

Location type	Sexual offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial approach	Indoors: 24.3% Outdoors: 75.7%	Indoors: 21.3% Outdoors: 78.7%	0.14	.71	-0.03
Attack	Indoors: 27.0% Outdoors: 73.0%	Indoors: 23.4% Outdoors: 76.6%	0.19	.66	-0.04
Crime	Indoors: 43.2% Outdoors: 56.8%	Indoors: 34.0% Outdoors: 66.0%	0.97	.35	-0.09
Victim release	Indoors: 48.6% Outdoors: 51.2%	Indoors: 34.0% Outdoors: 66%	2.40	.12	-0.14

Appendix 62: Percentages and Fisher's Exact output for Sexual offences v. Transportation

Variable	Sexual offences		Test output	
	Yes	No	*p*	ϕ
Transport	Foot: 94.6% No Foot: 5.4%	Foot: 91.5% No Foot: 8.5%	.72	0.05

Appendix 63: Percentages and Chi-square output for Sexual offences and Individual offence behaviours

Behaviour	Sexual offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	21.6	17.0	0.38	.54	0.05
No Anal penile	78.4	83.0			
Apologised	5.4	4.3		1.00	0.03
No Apologised	94.6	95.7			
Bit	0	8.5	3.35	.07	-0.16
No Bit	100	91.5			
Blindfolded material	13.5	6.4	1.76	.19	0.12
No Blindfolded material	86.5	93.6			
Breasts	13.5	9.6	0.43	.51	0.06
No Breasts	86.5	90.4			
Complimented	18.9	6.4	4.67	.03	0.19
No Complimented	81.8	93.6			
Condom	16.2	18.1	0.06	.80	-0.02
No Condom	83.8	81.9			
Control violence	86.5	87.2	0.01	.91	-0.01
No Control violence	13.5	12.8			
Cuddled	18.9	5.3	5.90	.02	0.21
No Cuddled	81.1	94.7			
Disguise	10.8	2.1		.05	0.19
No Disguise	89.2	97.9			
Ejaculated	37.8	37.2	0.00	.95	0.01
No Ejaculated	62.2	62.8			
Erectile dysfunction	8.1	9.6	0.07	.79	-0.02
No Erectile dysfunction	91.9	90.4			
Excused or justified	8.1	4.3	0.78	.38	0.08
No Excused or justified	91.9	95.7			
Fellatio	43.2	44.7	0.02	.88	-0.01
No Fellatio	56.8	55.3			
Gagged hand	16.2	12.8	0.27	.61	0.05
No Gagged hand	83.8	87.2			
Implied knowing	5.4	7.4	0.17	.68	-0.04
No Implied knowing	94.6	92.6			
Kissed	40.5	36.2	0.22	.64	0.04
No Kissed	59.5	63.8			
Locked in	2.7	11.7	2.58	.11	-0.14
No Locked in	97.3	88.3			
Masturbation hand	10.8	3.2	3.05	.08	0.15
No Masturbation hand	89.2	96.8			

Appendix 63: Percentages and Chi-square output for Sexual offences and Individual offence behaviours (continued)

Behaviour	Sexual offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Non sexual questions	16.2	21.3	0.43	.51	-0.06
No Non sexual questions	83.8	78.7			
Penis testicles public hair touched	10.8	8.5	0.17	.68	0.04
No Penis testicles public hair touched	89.2	91.5			
Ordered no noise	45.9	40.4	0.33	.56	0.05
No Ordered no noise	54.1	59.6			
Ordered no look	13.5	7.4	1.17	.28	0.10
No Ordered no look	86.5	92.6			
Ordered no report	13.5	13.8	0.00	.96	0.00
No Ordered no report	86.5	86.2			
Ordered property	24.3	22.3	0.06	.81	0.02
No Ordered property	75.7	77.7			
Ordered redress	16.2	5.3	4.10	.04	0.18
No Ordered redress	83.8	94.7			
Ordered sexual activity	64.9	47.9	3.08	.08	0.15
No Ordered sexual activity	35.1	52.1			
Ordered wait escape	8.1	4.3	0.78	.38	0.08
No Ordered wait escape	91.9	95.7			
Ordered undress	27.0	11.7	4.63	.03	0.19
No Ordered undress	73.0	88.3			
Physical violence	40.5	34.0	0.49	.49	0.06
No Physical violence	59.5	66.0			
Rummaged	13.5	13.8	0.00	.96	0.00
No Rummaged	86.5	86.2			
Sat or laid beside victim	13.5	2.1	6.81	.009	0.23
No Sat Laid	86.5	97.9			
Self disclosure criminal	13.5	8.5	0.74	.39	0.52
No Self disclosure criminal	86.5	91.5			
Self disclosure personal	32.4	26.6	0.45	.50	0.52
No Self disclosure personal	67.6	73.4			
Sexual questions	8.1	6.4	0.12	.73	0.03
No Sexual questions	91.9	93.6			
Stole property	27.0	51.1	6.22	.01	-0.22
No Stole property	73.0	48.9			
Threatened physical violence	35.1	28.7	0.52	.47	0.06
No Threatened physical violence	64.9	71.3			

Appendix 63: Percentages and Chi-square output for Sexual offences and Individual offence behaviours (continued)

Behaviour	Sexual offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Threatened weapon	32.4	20.2	2.20	.14	0.13
No Threatened weapon	67.6	79.8			
Tobacco smoked	8.1	3.2		.35	0.11
No Tobacco smoked	91.9	96.8			
Tore clothing	8.1	10.6	0.19	.66	-0.04
No Tore clothing	91.9	89.4			
Vaginal digital	21.6	14.9	0.86	.35	0.08
No Vaginal digital	78.4	85.1			
Vaginal penile	67.6	74.5	0.63	.43	-0.07
No Vaginal penile	32.4	25.5			
Verbal abuse	21.6	8.5	4.26	.04	0.18
No Verbal abuse	78.4	91.5			
Victim arousal	21.6	7.4	5.26	.02	0.20
No Victim arousal	78.4	92.6			
Weapon from scene	5.4	9.6	0.60	.44	-0.07
No Weapon from scene	94.6	90.4			
Weapon to scene	32.4	21.3	1.79	.18	0.12
No Weapon to scene	67.6	78.7			

Appendix 64: Percentages and Chi-square output for Theft offences v. Geo-mobility style

Variable	Theft Offence		Test output		
Geo-mobility style	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 10.7% No Intruded: 89.3%	Intruded: 17.3% No Intruded: 82.7%	2.04	.56	0.13
Ambushed	Ambushed: 21.4% No Ambushed: 78.6%	Ambushed: 25.3% No Ambushed: 74.7%			
Abducted	Abducted: 55.4% No Abducted: 44.6%	Abducted: 44.0% No Abducted: 56%			
Followed	Followed: 12.5% No Followed: 87.5%	Followed: 13.3% No Followed: 86.7%			

Appendix 65: Percentages and Chi-square output for Theft offences and Location type

Location Type	Theft offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial Approach	Indoors: 16.1% Outdoors: 83.9%	Indoors: 26.7% Outdoors: 73.3%	2.09	.15	0.13
Attack	Indoors: 17.9% Outdoors: 82.1%	Indoors: 29.3% Outdoors: 70.7%	2.29	.13	0.13
Crime	Indoors: 37.5% Outdoors: 62.5%	Indoors: 36.0% Outdoors: 64.0%	0.03	.86	-0.02
Victim Release	Indoors: 35.7% Outdoors: 64.3%	Indoors: 40.0% Outdoors: 60.0%	0.25	.62	0.04

Appendix 66: Percentages and Chi-square output for Theft offences v. Transportation type

Variable	Theft offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 96.4% No Foot: 3.6%	Foot: 89.3% No Foot: 10.7%	2.29	.13	0.13

Appendix 67: Percentages and Chi-square output for Theft offences and Individual offence behaviours

Behaviour	Theft offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	19.6	17.3	0.11	.74	0.03
No Anal penile	80.4	82.7			
Apologised	3.6	5.3		1.00	-0.04
No Apologised	96.4	94.7			
Bit	5.4	6.7	0.10	.76	-0.03
No Bit	94.6	93.3			
Blindfolded material	10.7	6.7	0.68	.41	0.07
No Blindfolded material	89.3	93.3			
Breasts	10.7	10.7	0.00	1.00	0.00
No Breasts	89.3	89.3			
Complimented	5.4	13.3	2.28	.13	-0.13
No Complimented	94.6	86.7			
Condom	23.2	13.3	2.16	.14	0.13
No Condom	76.8	86.7			
Control violence	87.5	86.7	0.02	.89	0.01
No Control violence	12.5	13.3			
Cuddled	14.3	5.3	3.09	.08	0.15
No Cuddled	85.7	94.7			
Disguise	7.1	2.7	1.47	.23	0.11
No Disguise	92.9	97.3			
Ejaculated	39.3	36.0	0.15	.70	0.03
No Ejaculated	60.7	64.0			
Erectile dysfunction	12.5	6.7	1.31	.25	0.10
No Erectile dysfunction	87.5	93.3			
Excused or justified	8.9	2.7		.14	0.14
No Excused or justified	91.1	97.3			
Fellatio	46.4	42.7	0.18	.67	0.04
No Fellatio	53.6	57.3			
Gagged hand	8.9	17.3	1.91	.17	-0.12
No Gagged hand	91.9	82.7			
Implied knowing	7.1	6.7	0.01	.92	0.01
No Implied knowing	92.9	93.3			
Kissed	41.4	34.7	0.56	.45	0.07
No Kissed	58.9	65.3			
Locked in	8.9	9.3	0.07	.04	-0.07
No Locked in	91.1	90.7			

Appendix 68: Percentages and Chi-square output for Theft offences and Individual offence behaviours (continued)

Behaviour	Theft offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Masturbation hand	3.6	6.7	0.61	.44	-0.07
No Masturbation hand	96.4	93.3			
Non sexual questions	23.2	17.3	0.70	.40	0.07
No Non sexual questions	76.8	82.7			
Ordered no noise	42.9	41.3	0.03	.86	0.02
No Ordered no noise	57.1	58.7			
Ordered no look	7.1	10.7	0.48	.49	-0.06
No Ordered no look	92.9	89.3			
Ordered no report	14.3	13.3	0.03	.88	0.01
No Ordered no report	85.7	86.7			
Ordered property	21.4	24.0	0.12	.73	-0.03
No Ordered property	78.6	76.0			
Ordered redress	8.9	8.0	0.04	.85	0.02
No Ordered redress	91.1	92.0			
Ordered sexual activity	58.9	48.0	1.54	.22	0.11
No Ordered sexual activity	41.1	52.0			
Ordered wait escape	5.4	5.3		1.00	0.00
No Ordered wait escape	94.6	94.7			
Ordered undress	23.2	10.7	3.75	.05	0.17
No Ordered undress	76.8	89.3			
Penis testicles public hair touched	10.7	8.0	0.28	.59	0.05
No Penis testicles public hair touched	89.3	92.0			
Physical violence	37.5	34.7	0.11	.74	0.03
No Physical violence	62.5	65.3			
Rummaged	17.9	10.7	1.40	.24	0.10
No Rummaged	82.1	89.3			
Sat or laid beside victim	5.4	5.3	0.00	1.00	0.00
No Sat Laid	94.6	94.7			
Self disclosure criminal	14.3	6.7	2.08	.15	0.13
No Self disclosure criminal	85.7	93.3			
Self disclosure personal	39.3	20.0	5.88	.02	0.21
No Self disclosure personal	60.7	80.0			
Sexual questions	7.1	6.7	0.01	.92	0.01
No Sexual questions	92.9	93.3			
Stole property	44.6	44.0	0.01	.94	0.01
No Stole property	55.4	56.0			
Threatened physical violence	33.9	28.0	0.53	.47	0.06
No Threatened physical violence	66.1	72.0			

Appendix 68: Percentages and Chi-square output for Theft offences and Individual offence behaviours (continued)

Behaviour	Theft offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Threatened weapon	26.8	21.3	0.53	.47	0.06
No Threatened weapon	73.2	78.7			
Tobacco smoked	1.8	6.7		.24	-0.12
No Tobacco smoked	98.2	93.3			
Tore clothing	8.9	10.7	0.11	.74	-0.03
No Tore clothing	91.1	89.3			
Vaginal digital	19.6	14.7	0.57	.45	0.07
No Vaginal digital	80.4	85.3			
Vaginal penile	82.1	65.3	4.55	.03	0.19
No Vaginal penile	17.9	34.7			
Verbal abuse	14.3	10.7	0.39	.53	0.06
No Verbal abuse	85.7	89.3			
Victim arousal	5.4	16.0	3.58	.06	-0.17
No Victim arousal	94.6	84.0			
Weapon from scene	7.1	9.3	0.20	.66	-0.04
No Weapon from scene	92.9	90.7			
Weapon to scene	30.4	20.0	1.86	.17	0.12
No Weapon to scene	69.6	80.0			

Appendix 69: Percentages and Chi-Square output for Violent offences v. Geo-mobility style

Geo-mobility style	Violent offence		Test output		
	Yes	No	χ^2	*p*	ϕ
Intruded	Intruded: 19.7% No Intruded: 80.3%	Intruded: 7.3% No Intruded: 92.7%	6.92	.08	0.23
Ambushed	Ambushed: 18.4% No Ambushed: 81.6%	Ambushed: 30.9% No Ambushed: 69.1%			
Abducted	Abducted: 46.1% No Abducted: 53.9%	Abducted: 52.7% No Abducted: 47.3%			
Followed	Followed: 15.8% No Followed: 84.2%	Followed: 15.8% No Followed: 84.2%			

Appendix 70: Percentages and Chi-Square output for Violent offences and Location type

Location Type	Violent offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Initial Approach	Indoors: 31.6% Outdoors: 68.4%	Indoors: 9.1% Outdoors: 90.9%	9.36	.002	-0.27
Attack	Indoors: 31.6% Outdoors: 68.4%	Indoors: 14.5% Outdoors: 85.5%	5.02	.03	-0.20
Crime	Indoors: 40.8% Outdoors: 59.2%	Indoors: 30.9% Outdoors: 69.1%	1.34	.25	0.25
Victim Release	Indoors: 40.8% Outdoors: 59.2%	Indoors: 34.5% Outdoors: 65.5%	0.53	.47	-0.06

Appendix 71: Percentages and Chi-Square output for Violent offences v. Transportation

Variable	Violent offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Transport	Foot: 93.4% No Foot: 6.6%	Foot: 90.9% No Foot: 9.1%	0.29	.59	0.05

Appendix 72: Percentages and Chi-Square output for Violent offences and Individual offence behaviours

Behaviour	Violent offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Anal penile	17.1	20.0	0.67	.82	-0.04
No Anal penile	82.9	80.0			
Apologised	3.9	5.5		.70	-0.04
No Apologised	96.1	94.5			
Bit	9.2	1.8		.14	0.15
No Bit	90.8	98.2			
Blindfolded material	9.2	7.3	0.16	.69	0.03
No Blindfolded material	90.8	92.7			
Breasts	13.2	7.3	1.16	.28	0.09
No Breasts	86.8	92.7			
Complimented	9.2	10.9	0.10	.75	-0.03
No Complimented	90.8	89.1			
Condom	22.4	10.9	2.90	.09	0.15
No Condom	77.6	89.1			
Control violence	86.8	87.3	0.01	.94	-0.01
No Control violence	13.2	12.7			
Cuddled	9.2	9.1	0.00	.98	0.00
No Cuddled	90.8	90.9			
Disguise	5.3	3.6		.04	0.66
No Disguise	94.7	96.4			
Ejaculated	60	40	0.27	.60	-0.05
No Ejaculated	64.5	35.5			
Erectile dysfunction	11.8	5.5	1.57	.21	0.11
No Erectile dysfunction	88.2	94.5			
Excused or justified	6.6	3.6		.70	0.07
No Excused or justified	93.4	96.4			
Fellatio	44.7	43.6	0.02	.90	0.01
No Fellatio	55.3	56.4			
Gagged hand	11.8	16.4	0.55	.46	0.61
No Gagged hand	88.2	83.6			
Implied knowing	6.6	7.3	0.02	.88	-0.01
No Implied knowing	93.4	92.7			
Kissed	34.2	41.8	0.79	.37	-0.08
No Kissed	65.8	58.2			
Locked in	9.2	9.1	0.00	.98	0.00
No Locked in	90.8	90.9			

Appendix 72: Percentages and Chi-Square output for Violent offences and Individual offence behaviours (continued)

Behaviour	Violent offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Masturbation hand	6.6	3.6		.70	0.07
No Masturbation hand	93.4	96.4			
Non sexual questions	18.4	21.8	0.23	.63	-0.04
No Non sexual questions	81.6	78.2			
Ordered no noise	43.4	40.0	0.15	.72	0.03
No Ordered no noise	56.6	60.0			
Ordered no look	10.5	7.3	0.41	.52	0.06
No Ordered no look	89.5	92.7			
Ordered no report	18.4	7.3	3.35	.07	0.16
No Ordered no report	81.6	92.7			
Ordered property	26.3	18.2	1.20	.27	0.10
No Ordered property	73.7	81.8			
Ordered redress	9.2	7.3	0.16	.69	0.03
No Ordered redress	90.8	92.7			
Ordered sexual activity	53.9	50.9	0.12	.73	0.03
No Ordered sexual activity	46.1	49.1			
Ordered wait escape	6.6	3.6		.70	0.07
No Ordered wait escape	93.4	96.4			
Ordered undress	19.7	10.9	1.85	.17	0.12
No Ordered undress	80.3	89.1			
Penis testicles public hair touched	9.2	9.1	0.00	1.00	0.00
No Penis testicles public hair touched	90.8	90.9			
Physical violence	36.8	34.5	0.07	.79	0.02
No Physical violence	63.2	65.5			
Rummaged	17.1	9.1	1.73	.19	0.12
No Rummaged	82.9	90.9			
Sat or laid beside victim	3.9	7.3		.45	-0.07
No Sat Laid	96.1	92.7			
Self disclosure criminal	11.8	7.3	0.75	.39	0.08
No Self disclosure criminal	88.2	92.7			
Self disclosure personal	30.3	25.5	0.36	.55	0.05
No Self disclosure personal	69.7	74.5			
Sexual questions	7.9	5.5	0.30	.59	0.05
No Sexual questions	92.1	94.5			
Stole property	46.1	41.8	0.23	.63	0.04
No Stole property	53.9	58.2			

Appendix 72: Percentages and Chi-Square output for Violent offences and Individual offence behaviours (continued)

Behaviour	Violent offences		Test output		
	Yes	No	χ^2	*p*	ϕ
Threatened physical violence	34.2	25.5	1.15	.28	0.09
No Threatened physical violence	65.8	74.5			
Threatened weapon	25.0	21.8	0.18	.67	0.04
No Threatened weapon	75.0	78.2			
Tobacco smoked	6.6	1.8		.40	0.11
No Tobacco smoked	93.4	98.2			
Tore clothing	9.2	10.9	0.10	.75	-0.03
No Tore clothing	90.8	89.1			
Vaginal digital	18.4	14.5	0.34	.56	0.05
No Vaginal digital	81.6	85.5			
Vaginal penile	78.9	63.6	3.75	.05	0.17
No Vaginal penile	21.1	36.4			
Verbal abuse	13.2	10.9	0.15	.70	0.03
No Verbal abuse	86.8	89.1			
Victim arousal	13.2	9.1	0.52	.47	0.06
No Victim arousal	86.8	90.9			
Weapon from scene	10.5	5.5	1.07	.30	0.09
No Weapon from scene	89.5	94.5			
Weapon to scene	27.6	20.0	1.01	.32	0.09
No Weapon to scene	72.4	80.0			

Appendix 73: Descriptive statistics and Kruskal-Wallis output for Distance to previous offences and Geo-mobility style

		Distance (in km)		Test output	
	n	Median	Range	χ^2	*p*
Intruded	13	3.56	0.25-9.51	4.66	.20
Ambushed	18	2.55	0.49-6.44		
Abducted	43	2.24	0.00-31.57		
Followed	12	1.80	0.58-3.96		

Appendix 74: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Initial approach location type

		Distance to previous offences		Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	20	2.85	0.11-9.51	714.50	.56	0.06
Outdoors	66	2.33	0.00-31.57			

Appendix 75: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Attack location type

	Distance to previous offences			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	20	2.85	0.11-9.51	703.50	.66	0.05
Outdoors	66	2.38	0.00-31.57			

Appendix 76: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Crime location type

	Distance to previous offences			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	33	2.24	0.00-9.51	810.50	.57	-0.09
Outdoors	53	2.55	0.20-31.57			

Appendix 77: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Victim release location type

	Distance to previous offences			Test output		
	n	Median	Range	*U*	*p*	*r*
Indoors	33	2.18	0.00-9.51	785.50	.43	-0.06
Outdoors	53	2.55	0.20-31.57			

Appendix 78: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Transportation type

	Distance to previous offences			Test output		
	n	Median	Range	*U*	*p*	*r*
Foot	81	2.31	0.00-31.57	113	.10	-0.18
No Foot	5	3.31	2.41-5.72			

Appendix 79: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Individual offence behaviours

Behaviour	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Anal penile	18	4.28	0.34-31.57	334.50	.003	-0.32
No Anal penile	68	2.13	0.00-9.51			
Apologised	2	2.62	2.36-2.88	79	.89	-0.06
No Apologised	84	2.43	0.00-31.57			
Bit	7	2.55	0.60-4.57	268	.89	-0.01
No Bit	79	2.36	0.00-31.57			
Blindfolded material	7	2.77	0.94-6.44	256	.75	-0.03
No Blindfolded material	79	2.41	0.00-31.57			
Breasts	11	1.06	0.00-4.57	189	.004	-0.31
No Breasts	75	2.69	0.11-31.57			
Complimented	9	1.84	0.25-3.99	257	.21	-0.14
No Complimented	77	2.55	0.00-31.57			

Appendix 79: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Individual offence behaviours (continued)

Behaviour	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Condom	18	1.84	0.11-6.04	548.50	.50	-0.07
No Condom	68	2.55	0.00-31.57			
Control violence	76	2.27	0.00-31.57	265	.12	-0.17
No Control violence	10	3.36	0.46-8.77			
Cuddled	9	1.84	0.00-4.99	220	.07	-0.19
No Cuddled	77	2.55	0.11-31.57			
Disguise	5	3.04	1.93-9.51	123.50	.15	-0.16
No Disguise	81	2.41	0.00-31.57			
Ejaculated	32	2.66	0.20-11.11	788.50	.50	-0.07
No Ejaculated	54	2.36	0.00-31.57			
Erectile dysfunction	11	1.87	0.58-5.20	369.50	.58	-0.06
No Erectile dysfunction	75	2.55	0.00-31.57			
Excused or justified	6	2.22	0.34	233	.91	-0.01
No Excused or justified	80	2.51	0.00-31.57			
Fellatio	38	2.62	0.25-11.11	835	.50	-0.07
No Fellatio	48	2.43	0.00-31.57			
Gagged hand	11	2.69	0.30-3.96	410.50	.98	0.00
No Gagged hand	75	2.41	0.00-31.57			
Implied knowing	5	3.97	1.06-5.95	157	.40	-0.10
No Implied knowing	81	2.41	0.00-31.57			
Kissed	34	2.13	0.00-8.77	824	.60	-0.06
No Kissed	52	2.51	0.11-31.57			
Locked in	8	1.78	0.11-5.59	263	.47	-0.08
No Locked in	78	2.51	0.00-31/57			
Masturbation hand	5	3.56	0.25-9.51	188.50	.80	-0.03
No Masturbation hand	81	2.41	0.00-31.57			
Non sexual questions	18	2.80	0.25-9.51	545	.48	-0.08
No Non sexual questions	68	2.38	0.00-31.57			
Penis testicles public hair touched	9	1.75	0.25-6.44	267	.26	-0.12
No Penis testicles public hair touched	77	2.55	0.00-31.57			
Physical violence	31	2.46	0.11-6.44	837.50	.89	-0.01
No Physical violence	55	2.41	0.00-31.57			
Ordered no noise	36	1.60	0.00-6.44	564	.003	-0.32
No Ordered no noise	50	3.04	0.20-31.57			
Ordered no look	8	2.90	0.25-8.77	309.50	.97	-0.00
No Ordered no look	78	2.38	0.00-31.57			
Ordered no report	15	3.04	0.00-9.51	437.50	.28	-0.17
No Ordered no report	71	2.36	0.11-31.57			
Ordered property	18	2.75	0.25-9.51	507	.27	-0.12
No Ordered property	68	2.33	0.00-31.57			
Ordered redress	7	1.93	0.25-4.57	240.50	.57	-0.06
No Ordered redress	79	2.46	0.00-31.57			

Appendix 79: Descriptive statistics and Mann Whitney U output for Distance to previous offences and Individual offence behaviours (continued)

Behaviour	Distance (in km)			Test output		
	n	Median	Range	*U*	*p*	*r*
Ordered sexual activity	47	2.01	0.00-31.57	773.50	.22	-0.13
No Ordered sexual activity	39	2.69	0.20-9.51			
Ordered wait escape	6	2.38	0.11-5.62	202.50	.53	-0.07
No Ordered wait escape	80	2.43	0.00-31.57			
Ordered undress	18	1.96	0.00-8.77	459	.10	-0.18
No Ordered undress	68	2.62	0.20-31.57			
Rummaged	11	3.97	0.49-8.77	231	.02	-0.25
No Rummaged	75	2.24	0.00-31.57			
Sat or laid beside victim	4	0.84	0.34-2.77	77	.08	0.01
No Sat Laid	82	2.51	0.00-31.57			
Self disclosure criminal	11	1.22	0.25-5.95	283.50	.10	-0.18
No Self disclosure criminal	75	2.55	0.00-31.57			
Self disclosure personal	28	1.21	0.25-5.95	743.50	.53	-0.07
No Self disclosure personal	58	2.55	0.00-31.57			
Sexual questions	7	1.84	0.25-6.04	259.50	.79	-0.03
No Sexual questions	79	2.46	0.00-31.57			
Stole property	37	2.01	0.11-9.51	865	.72	-0.04
No Stole property	49	2.46	0.00-31.57			
Tobacco smoked	5	1.84	0.11-9.51	192	.85	-0.02
No Tobacco smoked	81	3.49	0.00-27.20			
Threatened physical violence	26	2.56	0.11-9.51	772.50	.94	-0.01
No Threatened physical violence	60	2.43	0.00-31.57			
Threatened weapon	23	1.40	0.11-9.51	486	.02	-0.25
No Threatened weapon	63	2.77	0.00-31.57			
Tore clothing	6	1.41	0.58-3.41	174.50	.27	-0.12
No Tore clothing	80	2.51	0.00-31.57			
Vaginal digital	17	2.88	0.49-6.44	557.50	.75	-0.03
No Vaginal digital	69	2.36	0.00-31.57			
Vaginal penile	69	2.55	0.00-31.57	554.50	.73	-0.04
No Vaginal penile	17	2.31	0.25-5.69			
Verbal abuse	13	2.01	0.25-9.51	420	.51	-0.07
No Verbal abuse	73	2.46	0.00-31.57			
Victim arousal	9	1.87	0.25-6.04	303.50	.54	-0.07
No Victim arousal	77	2.46	0.00-31.57			
Weapon from scene	7	1.40	0.11-3.04	166.50	.08	-0.19
No Weapon from scene	79	2.55	0.00-31.57			
Weapon to scene	26	2.93	0.25-11.11	646.50	.21	-0.14
No Weapon to scene	60	2.27	0.00-31.57			

Appendix 80: Descriptive statistics and Welch and Brown-Forsythe test output for Mean inter-point distance and Geo-mobility style

	Distance (in km)			Test output			
	n	Mean	SD	Test	*F*	*p*	η^2
Intruded	14	4.16	2.73	Welch test	0.91	.45	0.26
Ambushed	21	4.59	3.13	Brown-Forsythe test	1.34	.29	
Abducted	42	3.70	2.85				
Followed	12	6.78	7.57				

Appendix 81: Descriptive statistics and Independent samples t-Test output for Mean inter-point distance and Initial approach location type

	Mean inter-point distance			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Indoors	21	4.38	2.67	-0.02	.98	-0.01
Outdoors	68	4.40	4.24			

Appendix 82: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Attack location type

	Mean inter-point distance			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Indoors	21	4.26	2.86	-0.19	.85	-0.05
Outdoors	68	4.44	4.20			

Appendix 83: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Crime location type

	Mean inter-point distance			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Indoors	33	3.75	2.70	-1.20	.23	-0.28
Outdoors	56	4.78	4.46			

Appendix 84: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Victim release location type

	Mean inter-point distance			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Indoors	33	3.91	2.87	-0.91	.37	-0.21
Outdoors	56	4.68	4.41			

Appendix 85: Descriptive statistics and Independent samples t-Test for Mean inter-point distance and Transportation type

	Mean inter-point distance			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Foot	84	4.04	3.06	1.43	.23	0.86
No Foot	5	10.31	9.79			

Appendix 86: Descriptive statistics and Independent t-test output for Mean inter-point distance and Individual offence behaviours

Behaviours	Distances (in km)			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Anal penile	18	7.15	5.85	-5.56	.001	-0.75
No Anal penile	71	3.70	2.91			
Apologised	2	6.59	2.79	-0.80	.43	0.64
No Apologised	87	4.44	3.93			
Bit	7	3.38	2.50	0.71	.48	-0.32
No Bit	82	4.48	4.01			
Blindfolded material	7	4.29	2.45	0.07	.94	-0.04
No Blindfolded material	82	4.41	4.02			
Breasts	10	2.11	2.33	1.99	.05	-0.79
No Breasts	79	4.69	3.99			
Complimented	9	4.29	3.74	0.08	.93	-0.03
No Complimented	80	4.41	3.95			
Condom	18	4.79	3.73	-0.47	.64	0.13
No Condom	71	4.30	3.98			
Control violence	79	4.40	4.07	-0.06	.95	0.02
No Control violence	10	4.32	2.48			
Cuddled	8	4.75	4.39	-0.27	.79	0.09
No Cuddled	81	4.36	3.89			
Disguise	5	4.26	2.67	0.08	.94	-0.04
No Disguise	84	4.40	3.99			
Ejaculated	33	4.48	3.12	-0.15	.88	0.03
No Ejaculated	56	4.35	4.34			
Erectile dysfunction	12	3.21	2.40	1.13	.26	-0.41
No Erectile dysfunction	77	4.58	4.08			
Excused or justified	6	3.97	2.49	0.27	.79	-0.14
No Excused or justified	83	4.43	4.00			
Fellatio	38	4.68	3.51	-0.59	.56	0.13
No Fellatio	51	4.18	4.21			
Gagged hand	12	4.14	3.20	0.24	.81	-0.08
No Gagged hand	77	4.44	4.03			
Implied knowing	5	3.22	2.98	0.69	.49	-0.36
No Implied knowing	84	4.47	3.96			
Kissed	34	4.16	3.12	0.45	.65	-0.10
No Kissed	55	4.54	4.35			

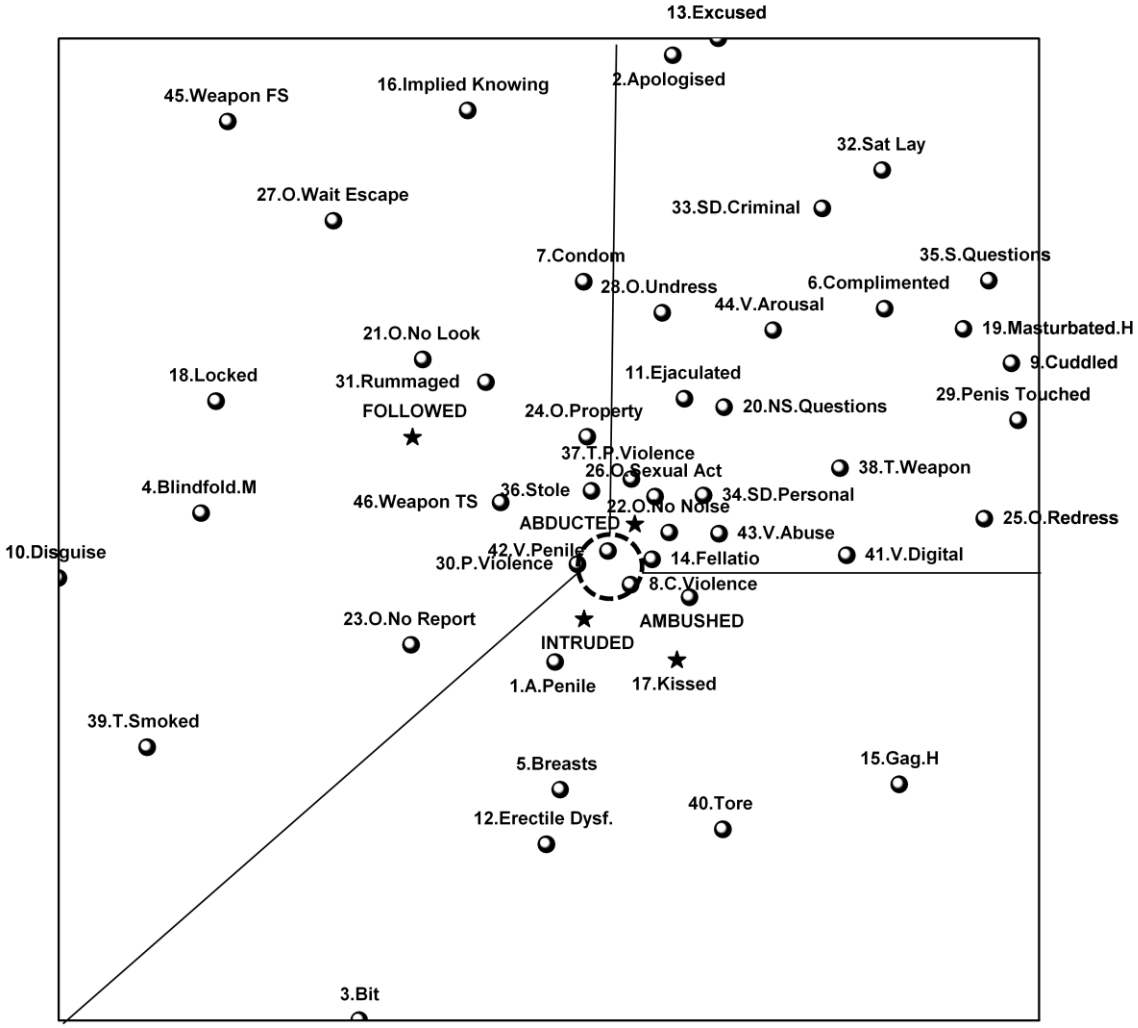
Appendix 86: Descriptive statistics and Independent t-test output for Mean inter-point distance and Individual offence behaviours (continued)

Behaviours	Distances (in km)			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Locked in	8	3.63	2.47	0.58	.57	0.27
No Locked in	81	4.47	4.03			
Masturbation hand	5	4.25	3.73	0.08	.94	-0.04
No Masturbation hand	84	4.40	3.94			
Non sexual questions	18	4.29	3.37	0.13	.90	-0.03
No Non sexual questions	71	4.42	4.06			
Ordered no noise	37	3.45	3.02	1.96	.05	-0.43
No Ordered no noise	52	5.07	4.34			
Ordered no look	9	3.00	2.34	1.13	.26	-0.47
No Ordered no look	80	4.55	4.03			
Ordered no report	14	5.03	2.53	-0.66	.51	0.22
No Ordered no report	75	4.28	4.12			
Ordered property	19	4.39	3.36	0.01	.99	0.00
No Ordered property	70	4.40	4.07			
Ordered redress	7	3.40	2.82	0.70	.49	-0.32
No Ordered redress	82	4.48	3.99			
Ordered sexual activity	48	3.93	3.27	1.21	.23	-0.26
No Ordered sexual activity	41	4.94	4.54			
Ordered wait escape	6	4.87	2.82	-0.31	.76	0.15
No Ordered wait escape	83	4.36	3.99			
Ordered undress	18	3.57	2.44	1.00	.32	-0.30
No Ordered undress	71	4.60	4.19			
Penis testicles public hair touched	9	3.27	2.88	0.91	.36	-0.39
No Penis testicles public hair touched	80	4.52	4.01			
Physical violence	32	4.56	3.16	-0.29	.77	0.07
No Physical violence	57	4.30	4.30			
Rummaged	12	3.92	2.53	0.45	.66	-0.16
No Rummaged	77	4.47	4.09			
Sat or laid beside victim	4	5.24	6.10	-0.44	.66	0.17
No Sat laid beside the victim	85	4.36	3.83			
Self disclosure criminal	11	2.87	2.52	1.39	.17	-0.52
No Self disclosure criminal	78	4.61	4.04			
Self disclosure personal	28	4.02	3.13	0.60	.55	-0.15
No Self disclosure personal	61	4.57	4.24			
Sexual questions	7	3.47	2.68	0.65	.52	-0.30
No Sexual questions	82	4.48	4.00			
Stole property	40	3.73	2.99	1.46	.15	-0.32
No Stole property	49	4.94	4.49			
Threatened physical violence	26	4.53	3.22	-0.21	.83	-0.05
No Threatened physical violence	63	4.34	4.19			
Threatened weapon	23	3.53	3.21	1.24	.22	-0.32
No Threatened weapon	66	4.70	4.11			

Appendix 86: Descriptive statistics and Independent t-test output for Mean inter-point distance and Individual offence behaviours (continued)

Behaviours	Distances (in km)			Test output		
	n	Mean	*SD*	*t*	*p*	*d*
Tobacco smoked	5	5.74	3.57	-0.79	.43	0.38
No Tobacco smoked	84	4.32	3.94			
Tore clothing	8	3.21	2.81	0.90	.37	-0.38
No Tore clothing	81	4.51	4.00			
Vaginal digital	18	4.60	3.01	-0.25	.80	0.07
No Vaginal digital	71	4.34	4.13			
Vaginal penile	71	4.54	3.92	-0.72	.48	0.19
No Vaginal penile	18	3.80	3.95			
Verbal abuse	13	3.52	2.56	0.87	.39	-0.30
No Verbal abuse	76	4.54	4.09			
Victim arousal	10	3.75	3.38	0.55	.58	-0.20
No Victim arousal	79	4.48	3.99			
Weapon from scene	7	3.34	2.31	0.74	.46	-0.50
No Weapon from scene	82	4.49	2.31			
Weapon to scene	26	4.82	3.54	-0.66	.51	0.16
No Weapon to scene	63	4.22	4.07			

Appendix 87: Smallest Space Analysis of the offence behaviour of single offenders (n = 102)



Appendix 87: Smallest Space Analysis of the offence behaviour of single offenders (n = 102) (continued)

Key: 1x2 solution of a 2 dimensional plot; Coefficient of alienation 0.30 in 40 iterations. Percentages in brackets.

★ Intruded (19.2)	16. Implied knowing (7.3)	35. Sexual questions (5.2)
★ Ambushed (25.3)	17. Kissed (34.4)	36. Stole property (39.6)
★ Abducted (41.4)	18. Locked in (9.4)	37. Threatened physical violence (33.3)
★ Followed (14.1)	19. Masturbated hand (6.3)	38. Threatened weapon (18.8)
1. Anal penile (18.8)	20. Non sexual questions (18.8)	39. Tobacco smoked (4.2)
2. Apologised (6.3)	21. Ordered no look (10.4)	40. Tore clothing (11.5)
3. Bit (5.2)	22. Ordered no noise (41.7)	41. Vaginal digital (16.7)
4. Blindfolded material (9.4)	23. Ordered no report (14.6)	42. Vaginal penile (70.8)
5. Breasts (9.8)	24. Ordered property (24.0)	43. Verbal abuse (25.0)
6. Complimented (8.3)	25. Ordered redress (8.3)	44. Victim arousal (10.4)
7. Condom (13.5)	26. Ordered sexual activity (49.9)	45. Weapon from scene (6.3)
8. Control violence (85.4)	27. Ordered wait escape (6.3)	46. Weapon to scene (25.0)
9. Cuddled (8.3)	28. Ordered undress (14.6)	
10. Disguise (4.2)	29. Penis testicles pubic hair touched masturbated (8.3)	
11. Ejaculated (34.0)	30. Physical violence (33.3)	
12. Erectile dysfunction (8.3)	31. Rummaged (13.5)	
13. Excused or justified (5.2)	32. Sat or laid beside victim (5.2)	
14. Fellatio (42.7)	33. Self-disclosure criminal (6.3)	
15. Gagged hand (18.8)	34. Self-disclosure personal (30.2)	